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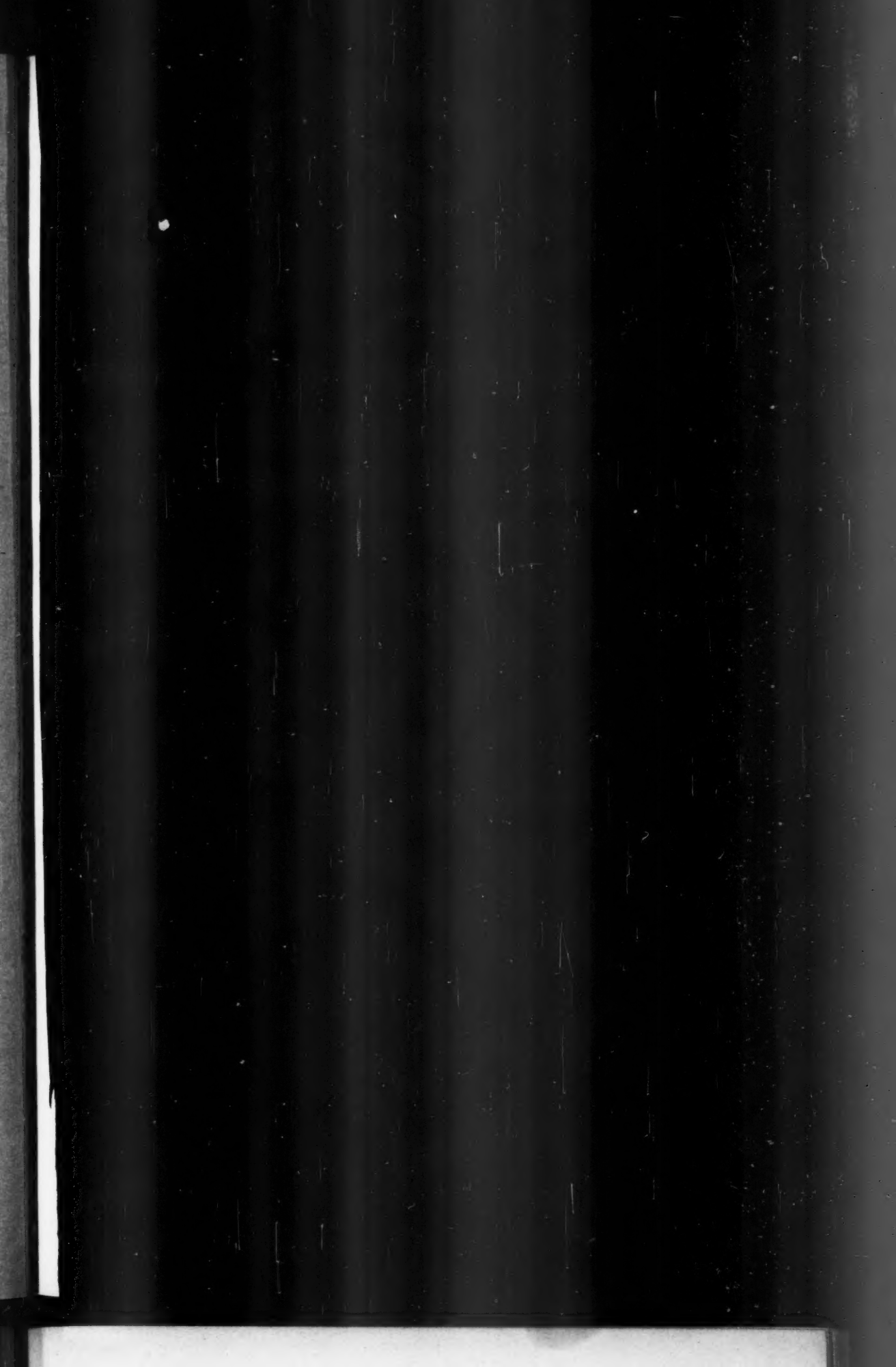

Student Personnel Service and Industrial Research[1]

The Student Personnel Office and Its Relation to Coöperative Research in Business and Industry

By W. V. Bingham, *Director, Division of Coöperative Research, Carnegie Institute of Technology, Pittsburgh*

It is sometimes well to call attention to needs and opportunities as well as accomplishments. This, Professor Bingham does in this article. He is setting forth what seems to him a satisfactory development for a student personnel office. He shows how such an office may function in furthering personnel and also other types of industrial research.

Professor Bingham's plan, however, is not Utopian. Many of the organizations and activities to which he refers have been in existence for some time and are now operative.[2] *Others of them are partially operative or foreshadowed. There are almost no parts of the plan which have not received trial in some university. It is the way in which these parts can be fitted together and made to operate as a whole that forms the subject matter of the present article.*

THE NEED AND THE OPPORTUNITY

NO PRIVILEGE of the university is more precious than its opportunity of helping its students to find themselves.

Many students with outstanding aptitudes, to be sure, need no help in planning their careers, but thousands choose their life occupations by merely drifting into them. What a stupendous waste! They elect to become teachers or surgeons or business men or mining engineers without adequate acquaintance with the requirements and rewards of these various occupations. They make momentous decisions without any systematic attempt to learn whether they may not possess, all unsuspected, special talent—in scientific research, for example. They need the sort of help that Harold Stevens found, at a critical hour.

[1] This paper was read before the meeting of Personnel Research Federation, held in New York, May 26, 1923.

[2] An historical account of the development of research bureaus at Carnegie Institute of Technology was published in The Scientific Monthly, February, 1913, 16: 2, pp. 141–159.

Stevens was an engineering sophomore, conscientious and hardworking; but after two years of persistent digging, failure loomed ahead. Twice he had received formal warning that his work must improve. This, however, seemed impossible for he was already doing his best. Inevitably he would be dropped. What could be salvaged from the wreck of his plans?

On careful inquiry it appeared that Stevens was studying engineering largely because his father and an uncle whom he admired both thought that it was the best training for earning a living. Neither he nor they had ascertained that the boy's natural endowment included somewhat less than the average ability in mechanics and in higher mathematics, and that he had no special talent for dealing with people. His native capabilities apparently had never been considered. He did fairly well in chemistry, but most of all he enjoyed being out-of-doors, studying natural history at first hand, and especially rocks. He had a collection of minerals which he had been gathering since early boyhood, searching for new specimens wherever he went. Asked why he had not studied geology as a profession, he hesitatingly confessed that the thought of teaching was distasteful to him. When the obvious fact was brought to his notice that an economic geologist is the key-man in many mining ventures, his face lighted. Impossible as it may seem, it had never occurred to him that there was a connection between his most enduring interest—in rocks—and what he considered a real live man's job. The upshot of the matter was that his entire attitude toward study changed. Stevens is now making a creditable record in an intensive geological and chemical course of training, directed straight toward the petroleum industry.

This is a simple and obvious case, and yet Stevens' predicament is that of multitudes of young men and women every year. What to do? What to study? What goal to choose? Many never find, as long as they live, a career rich in usefulness and happiness, one which might have been theirs if at the right moment the needed information about fields of opportunity as well as about their own abilities and aptitudes had been available. The Student Personnel Office with its auxiliary research activities is the indicated response of a university to this vast need.

THE PERSONNEL OFFICE OF THE FUTURE

The day is not remote when each university will have its Student Personnel Office. It will be in charge of a Dean who has large human sympathies and a deep understanding of young people, and who also has a thorough grasp of personnel principles and technique.

To this office, twice a year, each undergraduate in the institution will be entitled to come for a personal conference about his plans. Adjoining the Dean's room will be a reading room with all the best books and articles that have been written about occupations and careers. This information will be systematized so

that a student who wants to learn about a profession such as journalism or hospital management, or a career such as the illustrator's or the foreign missionary's, can instantly be referred to the most authoritative and illuminating sources.

The ideal vocational library will be systematized also from another angle, that of the student's aptitudes; for often a boy is not aware of the careers he really wants most to learn about. Here he can make the acquaintance of the most promising fields of opportunity. He can learn what rewards each one offers of financial return, of steadiness of employment, of rate of advancement, of personal satisfactions, of ultimate prestige, of opportunities for usefulness. He can find out what qualifications a man must have for happiness and success in each career, and what roads of training and experience lead in that direction. This library will be constantly renewed as the literature grows and as professional opportunities vary. Always it will be an attractive reading room, inviting to an exploration of life's varied occupational resources.

FINDING ONESELF

But a student, to lay his course wisely, must know not only about possible destinations, but also about himself. How is the Dean of Personnel best able to help him in self discovery and appraisal?

Much can of course be accomplished in personal interview. But in addition to the facts and impressions which readily come to the surface in an intimate conversation, the Dean needs to have at hand an educational summary of the student's career, including grades in the various subjects, together with a personal history record on which are noted such possibly significant items as accelerated or retarded rate of progress through school, participation in sports, work, history, hobbies and their persistence, instances of the exercise of personal leadership and responsibility, and ratings on non-intellectual traits, gathered both from instructors and from fellow students.

There is need also for improved interest analysis blanks, to facilitate the exploration for special aptitudes often unsuspected.

THE PROBABILITIES OF A STUDENT'S SUCCESS

An adjoining suite of small rooms should furnish needed space and quiet for individual examinations. Here assistants familiar with the special equipment and technique can find out how a student compares in essential measurable traits with students who have been measured in previous years and whose success or failure is now a matter of record. A prospective dental student, after having been given a series of tests of manual steadiness, strength, and delicacy of movement, will be told: "You rank in the top 10 per cent of dental students in native motor equipment. Do not hesitate to go ahead with your preparation for dentistry through uncertainty as to your ability to acquire the essential skill," or: "You are one of the many who are apt to be disappointed by discovering in the Junior or Senior

year that it is quite beyond you ever to acquire superior manual dexterity with dental tools. The records show that dental students starting on their training with physical equipment like yours have only 2 chances out of 7 of passing their senior technical examinations."

Probabilities of success will also be computed from standardized examinations of a more general nature. "A comparison of your test scores and scholarship grades with those of earlier students indicates that, other things remaining the same, your chances of making good in the medical school are 3 out of 5; in the law school, about 2 out of 5; in pharmacy, 9 out of 10. In engineering, freshmen who make the same score as you in these examinations have left school for one reason or another before February in 68 cases out of 100," and so on.

In the music room, equipped with tonoscope, audiometer, monochord and forks, a talented girl looking toward years of training for a musical career can find whether or not she has heavy handicaps in any of the elements of native musical capacity. Sometimes the examiner finds himself in a position to encourage training on the piano, for example, while predicting disappointment if voice or violin is attempted.

Students will be reminded that, although success in certain careers such as music is mainly conditioned by highly specialized abilities, in other occupations traits of character and personality are of more importance than either superior intelligence or specialized talent. Some salesmen, it seems, are successful chiefly because of dogged industry and personal forcefulness. To be an outstanding success as a teacher calls not only for scholarly mastery of one's subject, but also for a fine capacity to inspire. Excellence of voice and bearing, hardly essential for an accountant, are assets in a public career and can be cultivated.

Students are always glad to get inventories of their own traits of personality and character, especially when their significance for success is pointed out. For these purposes, all of the most useful aids, including self-ratings, instructors' ratings, standardized examinations and interviews, and cumulative records of past accomplishment, must be at the disposal of Dean and students as need arises.

AIDS TO PERSONAL GROWTH

Up to this point in our picture of the Student Personnel Office, it may have been inferred that the task of helping students to know themselves and their educational and occupational possibilities is one of finding a square hole of the right size for each square peg. Or, to use another inadequate analogy, the thousands of possible careers are like suits of clothes in a department store, and the Dean of Personnel is the salesman who takes the student's measure and then sorts out for his consideration the suits most likely to meet with his approval in fit, texture, pattern, durability and price. This analogy does violence to the facts in one essential regard. It assumes that the garment

must exactly fit the man; but in choosing a career, it is—ultimately—the man who grows and adapts himself to fit the garment.

Among the undergraduates, for example, is a prospective business man who is timid, who lacks self-confidence. His room-mate, on the other hand, is habitually over-confident, arrogant and cock-sure to a degree that robs him of influence or popularity even though he is aware of his handicap. To each of these boys the Dean gives not only the appropriate advice and encouragement, but also the technique of practice most likely to eliminate the undesired traits and bring about a just balance of self-esteem. The highest privilege and service of the Dean of Personnel is in helping students grow into their possibilities.

FOLLOWING-THROUGH TO THE END-RESULT

Highest value will attach to reliable information regarding the *ultimate* outcome of selection methods and of contrasted sorts of personal and educational influences. This information can be won only through patient, long-time researches.

The range of accuracy within which the Thurstone tests of engineering aptitude will predict the ability of a high school graduate to carry successfully the studies of an engineering course, is now known; but it is not yet known how accurately, if at all, the tests predict success in the practice of engineering. Years of follow-up are required. The relative value of different engineering curricula and methods of instruction similarly should be evaluated in terms of the professional competence for which they pave the way.

It is appalling how little is really known today of the final effects of selection and training. Something is known of more immediate results, such as increased ability to carry subsequent courses in the curriculum; but measures of more persisting effects are all too few.

Medical science was in a similar predicament until recently. It was customary to keep minute records while a patient was in the hospital, but after an apparently successful recovery and discharge, the account was closed. Then came a realization of the necessity for following-through to the end-result. Months and even years later, conditions were found to develop which had significant bearing on the original surgical and medical treatment. Perhaps no single modification of general procedure has done more to advance medical knowledge than this insistence upon the necessity of studying the remote consequences as well as the more immediate effects.

A new day will come in college education when a similar necessity is recognized and individual student and alumni records are kept with sufficient detail to permit study of the end-results of educational influences. The young people in colleges and professional schools are entitled to our best. Year by year we are modifying their minds and characters; and the influences we employ should be scrutinized and checked with a care and a knowledge of effects no less thorough than we

demand of those who treat their bodies. The Student Personnel Office and its affiliated research bureaus must have a far vision. Opportunities of service to students of future years and of other institutions must be kept in mind even in the pressure of immediate demands.

THE NEED FOR ALLIED RESEARCH BUREAUS

Before a university undertakes to operate such a student personnel office, it is necessary to face squarely the following facts. There are enormous gaps today in the information available to students about various fields of opportunity. There are equally large omissions in the available methods of examining students. And the data are all too meagre on which predictions of ultimate achievement can be made with reasonable reliability.

Research is imperative. To be sure, a most useful student personnel office can be operated today, as is already successfully operating under different names, at Dartmouth, Northwestern, Iowa, and Illinois; but a far-sighted policy will flank such an office with strong research agencies, to supplement and improve present practices.

This movement to proceed systematically about a vitally important task that has heretofore been neglected by our institutions or handled in a haphazard way, is relatively new. It is pioneer work. The Student Personnel Office must be an experimental station where procedures are developed for nationwide use. It needs the support of allied research departments. Moreover, these research departments need and can command the coöperation of large employers in industry and business.

COÖPERATION OF BUSINESS HOUSES

The best way to insure active support and coöperation from large industrial and commercial concerns is to carry on for them research on their own personnel problems. Such research they willingly pay for, because the results are demonstrably worth the cost.

The following are typical problems in the study of which industrial concerns and business associations have coöperated with the Bureaus at Carnegie Institute of Technology.

1. Classification and grading of jobs.
    a. Sales
    b. Clerical
    c. Executive
    d. Factory
2. Readjusting salary and wage scales.
3. Revising lines of promotion.
4. Preparing methods of selection and placement.
5. Preparing specific programs of training and supervision.
6. Planning formation of personnel department.
7. Studying form of executive organization.

The amount paid by an individual business house for this type of personnel research and service at Carnegie Institute of Technology has ranged from $500 to $13,000 annually. For the year 1922–1923 these sums total about $60,000. This

amount covers the cost of the work done for these concerns; but it does not provide for working up the data gathered in a way to yield either university curriculum material or generalizations in economics and psychology. The expense for such research has to be borne by the institution, or met by specific grants. At the same time, it is to be noted that economies for both the educational and the business researches result from the close association and cooperation of the two types of study.

RETURNS TO THE UNIVERSITY FROM COÖPERATIVE RESEARCH

The more tangible returns to higher education from this business research are:

1. Improvement in personnel research methods and technique.

2. Accumulation of data essential for the more technical studies (*a*) of occupations and careers, (*b*) of the traits and qualifications essential for success in those careers, and (*c*) of more general problems of psychology and economics.

3. Accumulation of data valuable for determining instructional objectives, and for constructing curricula.

Less tangible, perhaps, but important, is the vitalizing of classroom teaching that comes from the cross-fertilization of academic and industrial activities. Students listen when an instructor speaks with the enthusiasm and authority born of fresh contacts with the world of industry and affairs. Business executives also become increasingly cordial in their endorsement and support of a university with which they establish mutually helpful contacts.

Partly by such coöperative arrangements as these, the ideal university personnel organization will lay the foundation for its service to students both of today and of tomorrow. A group of related personnel research bureaus and departments will be built around the Student Personnel Office. Their obligations will be first to the undergraduates, then to the students of future years in this and other universities, to the boys and girls coming up through the public schools, and also the executives of coöperating industries and to the many thousands of men and women in their employ. Immediate service to students and employers will go hand in hand with research destined to increase our knowledge of human nature, our knowledge of occupations and careers, and our understanding of how best, through improved personnel practice, to make this knowledge available.

VALUES REMOTE AND IMMEDIATE

No one can question the ultimate social values of fundamental scientific research on these problems of life adjustment. Each increment of fact and principle will eventually modify practice, not only in institutions of higher learning, but wherever boys and girls come seeking information about themselves and their potentialities. These ultimate returns are well worth the necessary investment of years and brains and wealth.

But it is not necessary to wait for the remote completion of patient

research to realize returns on the investment. From the very beginning, the young men and women, the faculty members, the employers and the employees who are brought into touch with this work, are made thoughtful thereby. Almost immediately the tendency is to give more heed to each person's real welfare, to conserve and develop to the full each one's best possibilities. The actual work of personnel research itself yields repeated opportunities for helpful personal contacts. The impetus to self study and development which students receive under these wholesome auspices is a return immediate and tangible. Another valuable return is the stimulus to superior teaching, to more painstaking selection and classification of students, to greater personal interest in the graduates and their continued growth.

CASH RETURNS TO SOCIETY

These values may seem hard to gauge. But at least the financial returns can be conservatively estimated. They are large.

Consider the money value of one sensible well-informed vocational decision. Edward Emmett, home from the war in 1919, had planned to pick up again the thread of his interrupted electrical engineering course, until he learned that there are already relatively too many electrical engineers in comparison with the dearth of specialists in the ceramic industry. He accordingly changed his course, and on graduation three years later, stepped into a post in a great pottery works, at once more responsible and remunerative than that of any of his chums who had taken the electrical engineering training. Granted that he maintains this lead, the mere money value to him and to society of his increased earning power due to his decision to take up ceramics, has been estimated at about $70,000.

Can society afford to permit decisions involving such a money value to be made each year by multitudes of young men in the absence of full and accurate information regarding occupational possibilities and requirements?

Each mistaken decision of a college boy, wrongly made through lack of information, costs the community in the long run at least $50,000. Each career wisely chosen and wisely planned because adequate and timely aid is given in selecting the field where the most valued work can be done, by the same token adds upwards of $50,000 to the total wealth—not to mention the still greater social assests that accrue from the happiness and satisfaction of men and women engaged in congenial work. An agency that in the course of each year opens the way to a minimum of only two hundred right decisions—among the thousands annually made in a large city—adds every twelve months to the sum of productivity and community wealth a total of ten million dollars.

THE STAFF

Personnel service and research calls for men of experience and sound judgment. They must be equipped, both by temperament and by special training, to deal effectively with

people and with personnel problems. It is necessary that these men have assurance of a substantial livelihood and a reasonable security of tenure if they are to refuse business offers and to turn their energies wholeheartedly toward the development of a long-time program of personnel service and research.

An investment of $150,000 for the maintenance of such a staff, spread over a five-year period, should be matched more than two to one by funds from other sources. And every dollar so expended is a long-term investment. Through the years a constantly increasing number of students will find their way into careers rich in the satisfactions of work thoroughly enjoyed and well rewarded.

Is it not a major privilege of the Personnel Research Federation to assist in initiating and establishing such university personnel centers? The National Research Council has in the past three years made a notable effort to focus attention in the universities on the problem of the discovery of superior ability. To this end representatives of its Division of Educational Relations have visited numerous institutions, and have issued several bulletins vividly picturing the need for real personnel service to university students. The Personnel Research Federation may coöperate in this strategically important movement by pointing out the need and the practicability of buttressing the Student Personnel Office with research bureaus coöperating with industry and business.

SUMMARY OF ACTIVITIES OF UNIVERSITY INSTITUTE OF PERSONNEL RESEARCH

1. Maintaining the Student Personnel Office: to provide for individual conferences, for vocational reading, for examining, for keeping the files of current student histories and also the norms and statistics by reference to which predictions of a student's probable success are expressed.

2. Getting information about occupations and professions, the opportunities they present and the qualifications they require for success.

Charters' current researches on the pharmacist and on the private secretary, Strong's investigations on the functions of the manager in the building construction industry, and Yoakum's classification of types of executive and clerical positions, may be cited as typical steps toward what is needed.

3. Improving methods of finding out a student's abilities, interests and aptitudes.

B. V. Moore's differentiation of graduate engineers into successful designers and salesmen, and Thurstone's predictions of success in the first two years of the engineering college, are excellent examples of research on ways of helping a student to get a useful inventory of his own qualifications as an aid to educational and vocational decisions.

4. Following up individual graduates and non-graduates to learn the end-results of different kinds of education and experience.

No serious attempt has ever yet been made to maintain adequate records of educational and occupational careers, gathered in sufficient number and kept over a sufficient period of years, to be significant. Much can be done by coöperation with existing alumni and placement offices.

5. Preparing modifications of subject-matter, curricula, and training methods in the light of investigations as to what training actually is required for specific educational goals.

Charters' curriculum for training retail store executives to train sales people, the Carnegie life insurance sales supervisors' course, and the four-year curriculum for the training of printing executives, have been developed after careful scrutiny of systematically prepared duty analyses and analyses of difficulties.

6. Maintaining research coöperation with business and industrial establishments.

Large coöperation is needed from commercial concerns, such as those which have made possible the investigations of the Carnegie bureaus and the Industrial Research Department of the Wharton School.

7. Training advanced graduate students in the methods of personnel research and administration.

The investigations of the bureaus serve as a training laboratory. The demand for trained men, both in the universities and in business, exceeds the supply.

Scale Cage in Motion Study for Finding the Factor of the One Best Way to Do Work

A Device and Method for Inserting Measurement in Non-Stereoscopic Pictures

By Frank B. Gilbreth and L. M. Gilbreth

In this article, Mr. Gilbreth, a Director of the Society of Industrial Engineers and President of Frank B. Gilbreth, Inc., and Mrs. Gilbreth, an Honorary member of the Society of Industrial Engineers, describe a new micromotion study device and method for measuring the third dimension in non-stereoscopic as well as stereoscopic photographic records of motions and behavior—the scale cage. They have found that by analyzing the results of micromotion studies of human behavior it is possible not only to increase greatly the efficiency of operation, through the elimination of ill-directed and unnecessary motions, but also to avoid the unnecessary fatigue resulting from such motions.

THE economic importance of recording the One Best Way to Do Work, as demonstrated by the super-expert worker, makes it desirable to develop devices and methods for recording and measuring behavior.

We have, therefore, devised the Scale Cage as another micromotion study device for recording the facts relating to the phenomena of behavior in general, and skill and automaticity of the best worker obtainable in particular.

The scale cage is a device and method for the purpose of recording and measuring the third dimension in non-stereoscopic as well as stereoscopic photographic records of motions and behavior.

It is always desirable to have two cross-sectioned backgrounds and floor, usually, but not always, preferably at right angles to the other two, in all pictures of motion studies of the One Best Way to Do Work.

There are many instances, however, where it is difficult, if not impossible, to use the cross sectioned backgrounds and floor for recording relative positions and locations, and also for the paths and speeds of motions at the time that the picture of the worker is made.

In such, for examples, as records of motions of the out-of-door sports, particularly golf, baseball, tennis, and also work as picking berries, and nearly all of the building trades, it was particularly difficult to record accurately linear measurement and scale in perspective in pictures without

special and intricate preparation, until the invention of the scale cage.

The scale cage shown herein is made of 1 inch square material, 6 feet long, 3 feet wide and 3 feet high, and hinged for folding into a bundle of parallel sticks when not in use. After the pictures, which include the scale cage, are taken, they can be projected, preferably to be examined one at a time, or as moving pictures if desired, on the screen made of cross sectioned paper which will permit having the cross sectioned lines of the screen coincide at any point desired with the scale markings on the scale cage, according to the distance and angle that the screen on which the pictures are projected is held to the line of light projected.

Figure 1 shows micromotion studies of an epileptic in seizure. This is one example of many types of motions that cannot be expected to be recorded in a laboratory in front of the cross sectioned walls and reference points. For those who wish to know of the practical use of the scale cage in such studies, we will state that the measurement of motions of seizure is of use in determining laws of motions, particularly automaticity and transfer of skill.

The scale cage does not have to be in the picture, for the exact paths and speeds of all of his motions can be recorded and leisurely measured by inserting the scale cage on the foreground or background, in any spot desired, for determining scale after the photographic record of the seizure is finished.

Figure 2 shows a synthesized chronocyclograph of an epileptic who is also a sub-normal, performing the well known form-board test for measuring intelligence. Figure 3 shows a series of micromotion pictures from which the synthesized chronocyclograph was made. It is interesting to note that the motions of the sub-normal are very similar to the motions of the absent minded normal persons. The motions of the normal man not trained in the One Best Way to Do Work to a point of automaticity are also full of indications and registrations of indecisions that are identical to those of the sub-normal. Epileptics' motions in seizure are now valuable because they are known to be largely automaticity of habit formed during periods of consciousness.

One of the most interesting studies of motions is of those of the bricklayer. Here again, under actual working conditions, the scale cage is of value. The bricklayer has been laying brick in probably the same method for 7000 years. His number of generations for inheriting an instinct are trivial compared with the berry picker, and motion study has now enabled the bricklayer to do more than three times as much work with the same effort.

Figure 4 shows the scale cage used in micromotion studies for recording paths and distances in three dimensions of the motions of an expert picking cranberries in the usual method.

Figure 5 shows a scale cage used for a comparative study of children of various ages picking blueberries, without any instructions in berry picking, to find what methods and efficiency if any, or instinct, for

FIG. 1 FIG. 3

FIG. 1. MICROMOTION STUDIES OF AN EPILEPTIC IN SEIZURE

FIG. 3. MICROMOTION PICTURES FROM WHICH SYNTHESIZED CHRONOCLYCLOGRAPH WAS MADE

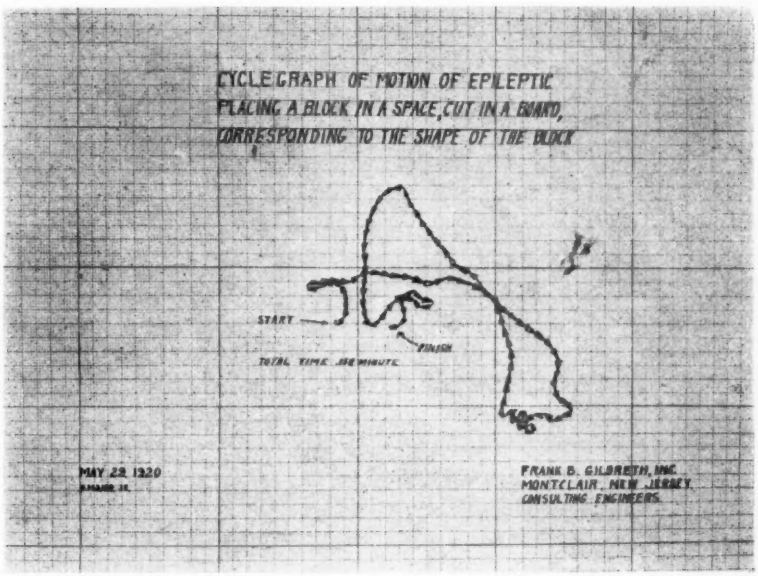
CYCLEGRAPH OF MOTION OF EPILEPTIC
PLACING A BLOCK IN A SPACE, CUT IN A BOARD,
CORRESPONDING TO THE SHAPE OF THE BLOCK
START
FINISH
MAY 23 1920
FRANK B. GILBRETH, INC.
MONTCLAIR, NEW JERSEY.
CONSULTING ENGINEERS.

FIG. 2. SYNTHESIZED CHRONOCYCLOGRAPH OF AN EPILEPTIC PERFORMING FORM BOARD TEST FOR MEASURING INTELLIGENCE

FIG. 4. USE OF SCALE CAGE IN MICROMOTION STUDIES OF AN EXPERT PICKING CRANBERRIES IN USUAL METHOD

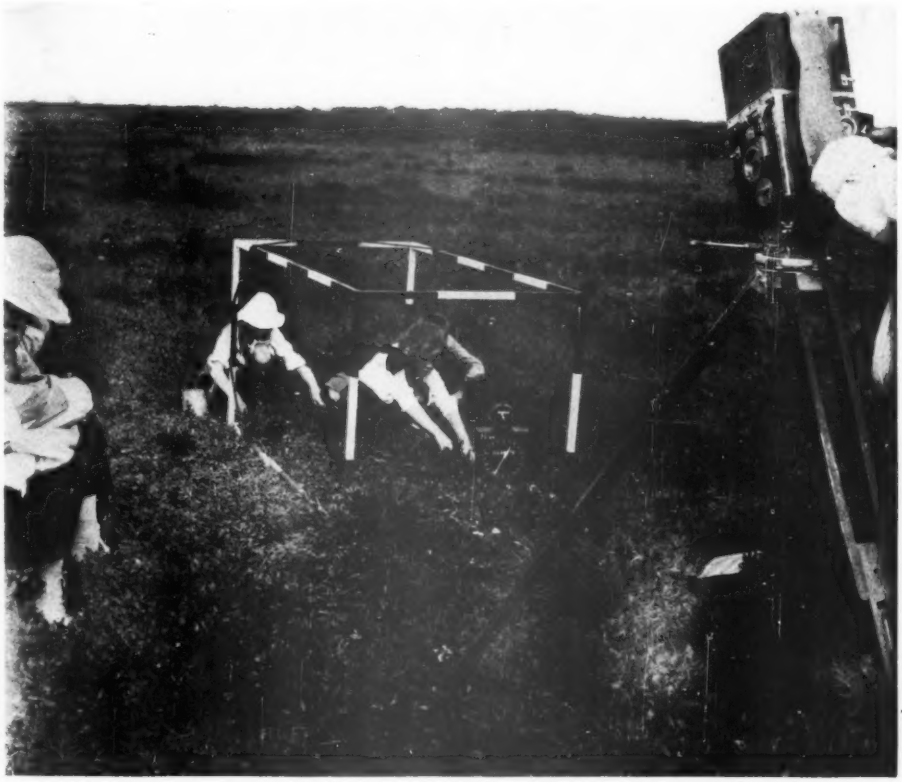

FIG. 5. USE OF SCALE CAGE IN COMPARATIVE STUDY OF CHILDREN OF VARIOUS AGES PICKING BLUEBERRIES

accomplishing this *most ancient trade*, is handed down through all of the generations.

It may not be out of place to state incidentally that the result of this set of studies may be accepted as further proof, if any more is needed, that the *One Best Way to Do Work is not a matter of instinct* and is not to be found in the method of these uninstructed in motion study, for the professional berry picker can be taught to increase his output threefold, and the amateur, most highly educated in everything except berry picking and motion study, fifteenfold. It is also additional proof that the One Best Way to Do Work cannot be obtained or derived except by micromotion study.

The berry pickers, the workers at the oldest of all trades, have left no record whatever of their skill handed down through all the generations of hundreds of thousands of years. There is, however, now no longer any logical excuse for not recording the best that is known for the benefit of the coming generations. The laws of the One Best Way to Do Work and the phenomena of all human behavior can now be recorded in ample detail for its complete and leisurely study.

The beginnings of recording of errorless data of all the arts, trades and professions, of all behavior, has been made during this generation for the first time since the beginning of history. *Many of the mental processes can now be recorded by photography.* The fact that one's thoughts are constantly changing is a principle reason why no two stereochronocycleographs are exactly alike. The fact that the moron makes cycles that are nearest alike furnishes interesting data regarding monotony, all of which the scale cage helps to record with accuracy.

Recording errorless knowledge is now available on all kinds of activity. It is for the engineer to make it cumulative. We hope that the scale cage will enable those interested in the One Best Way to Do Work to record and measure the best extent.

Figure 2 is a synthesized chronocyclograph, and is made by projecting the micromotion study pictures on a cross sectioned screen.

The motions of these parts of the anatomy to be studied can be recorded, by making on the paper the location of the anatomy in each frame of the film that is projected. The resulting chronocyclograph lines will show the complete paths and length of the motions in three dimensions, together with relative distance, exact distance, relative times, exact times, relative speeds, exact speeds and directions.

The cost of making and using a scale cage is trivial. It is offered without patents, and may be used for findings the facts by anyone interested in either the pure science and laws of motion study, or in the One Best Way to Do Work.

We offer it also as one more device and method for calling attention to its possibilities in connection with recording and synthesizing the One Best Way to Do Work, and recording of the elements of methods and skill of the super-expert, and also to the great waste resulting from inefficient, ill-directed and unnecessary motions and the resulting unnecessary fatigue which are the greatest cause of waste in the world today.

Studies in Student Personnel at Dartmouth College[1]

By Richard W. Husband, *Director of Personnel Research, Dartmouth College*

Part I. Scholarship in Dartmouth College

RECENTLY we prepared a series of tables which were intended to represent the scholarship condition of Dartmouth College at the close of the examinations held in February of this year. The tables covered the record of the Senior Class for seven semesters, of the Junior Class for five semesters, of the Sophomore Class for three semesters and of the Freshman Class for one semester. They included the history of each man who entered college regularly with any one of these four classes, except that those persons were omitted whose record was incomplete in some one of the particulars under discussion. Otherwise the history of the four classes is complete.

In order to get a degree a student must receive credit for 122 semester hours and 220 points. If a course is passed with the lowest permissible mark a student gets one point for each semester hour's credit. Consequently he must pass a considerable portion of his work with a much higher mark than a mere passing mark in order to obtain the minimum number of points required for a degree. A student is notified each year of the number of points he has toward his degree but there is no general reckoning with him on that ground until his four years are completed and if at that time he has 220 or more points and 122 semester hours he is granted his degree.

The tables in their original form are blocked out in colors to indicate the scholarship rank of the various groups of individuals. The colors were chosen from the standpoint of their significance rather than on the basis of artistic merit. Six colors comprise the scheme and have the following meaning:

A. Purple—Signifies Honor standing based upon the average of all courses taken since entrance to college.

B. Green—Is the Dartmouth College color and represents those who were in good standing but had not attained honors.

C. Red—Is the danger signal and was used to designate those who would not graduate with their classes if they maintained only the present rate of progress. The student whose rank was indicated by the danger signal had lost credit by failing courses or had received an average rank below the minimum required for a degree.

D. Black—Shows the black sheep who had been separated from College because of poor scholarship.

[1] This article is a summary of Dean Husband's talk before the annual meeting of Personnel Research Federation, May 26, 1923.

E. Yellow—Shows those students who had low standing in their courses and did not wait to take their final examinations but withdrew from college.

F. Blue—Includes those students who had withdrawn from college while in good standing, because of sickness, financial difficulties or other reasons.

It will be noticed throughout the tables that Groups A and B are the only ones who would graduate with their classes if their work continued to be as satisfactory as it has been to the present. Those in Group C will be obliged to do better or will be compelled to remain for an additional semester in order to get the number of points required for their degree. It will further be noticed that Groups D, E and F entered with one of the four classes now in college but for the reasons assigned are no longer in residence.

The present article is intended to show in a summarized form the facts that were disclosed by the tables.

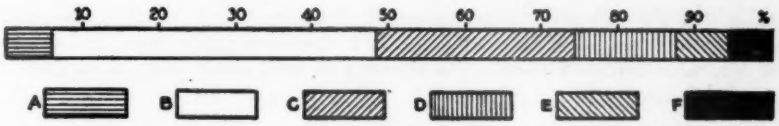

TABLE I

This table is a combined statement of the present condition of scholarship of all those students who entered with the classes of 1923, 1924, 1925 and 1926.

The distribution of the student body on the basis of scholarship attainment may be expressed in the following percentages:

	per cent
A—Honor Standing	6.0
B—Regular Standing	42.6
C—Unsatisfactory Progress	26.8
D—Separated for poor scholarship	12.0
E—Withdrew with low standing	7.25
F—Withdrew with good standing	5.21

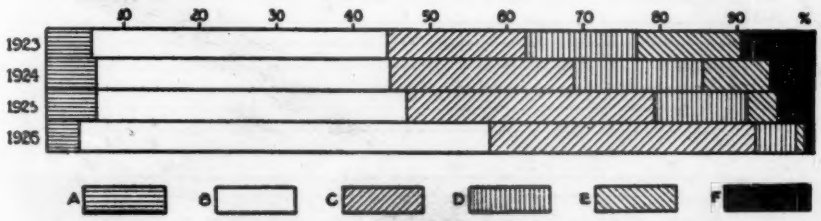

TABLE II

The second table presents the same general scholarship condition as the first but breaks down the summary into a picture of each of the four classes. The facts portrayed in the second table may be expressed on a percentage basis as follows:

	1923	1924	1925	1926
A	5.9	6.8	6.7	4.7
B	39.2	38.2	40.9	53.2
C	17.6	24.3	31.5	35.2
D	13.9	16.5	12.4	4.8
E	13.9	8.8	3.9	1.5
F	9.5	5.4	4.6	0.6

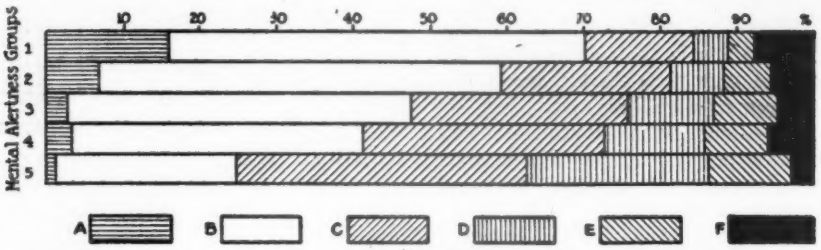

TABLE III

The third table shows the scholarship of the college presented according to the grouping of students in their Mental Alertness Test. Each of the four classes took such a test soon after entrance to college. A class was divided into five groups on the basis of their attainment in the test. Group 1 was the highest fifth of the class, Group 2 the next fifth and so on down to Group 5 which was the lowest fifth.

The table contains five strips running across the page. Each of the strips gives the scholarship condition of all of the men in all four classes of the college who stood in the indicated Mental Alertness Group. The showing of each group may be represented in percentages as follows:

Group	A	B	C	D	E	F
1	16.0	54.8	13.5	4.7	3.5	7.5
2	6.9	52.9	21.8	7.0	5.7	5.7
3	3.0	44.4	28.7	11.3	7.9	4.7
4	3.3	38.2	31.3	13.2	8.4	5.6
5	1.3	23.6	38.2	23.6	10.6	2.7

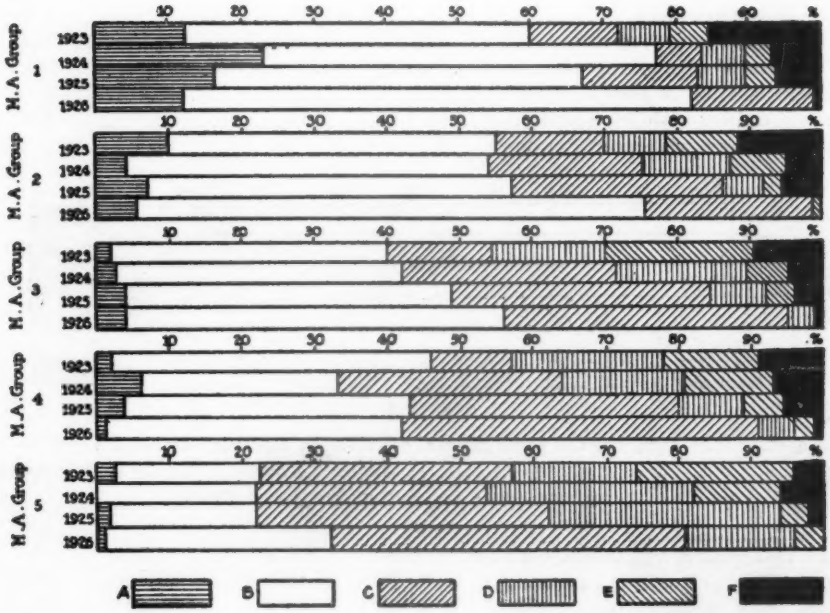

TABLE IV

The fourth table gives the facts about each of the Mental Alertness Groups pictured in the third table, but they are represented in a new way. The members of each of the

four classes who stood in the same group in their Mental Alertness Test are separated and presented in table IV according to the classes to which they belong. In this way the attainment of those in the highest group in any one class can be compared with the attainment of those in the highest group in each of the other three classes. Thus Group 1 in the Senior Class may be compared with Group 1 in the Junior, Sophomore and Freshman Classes and the same will apply to each of the five groups.

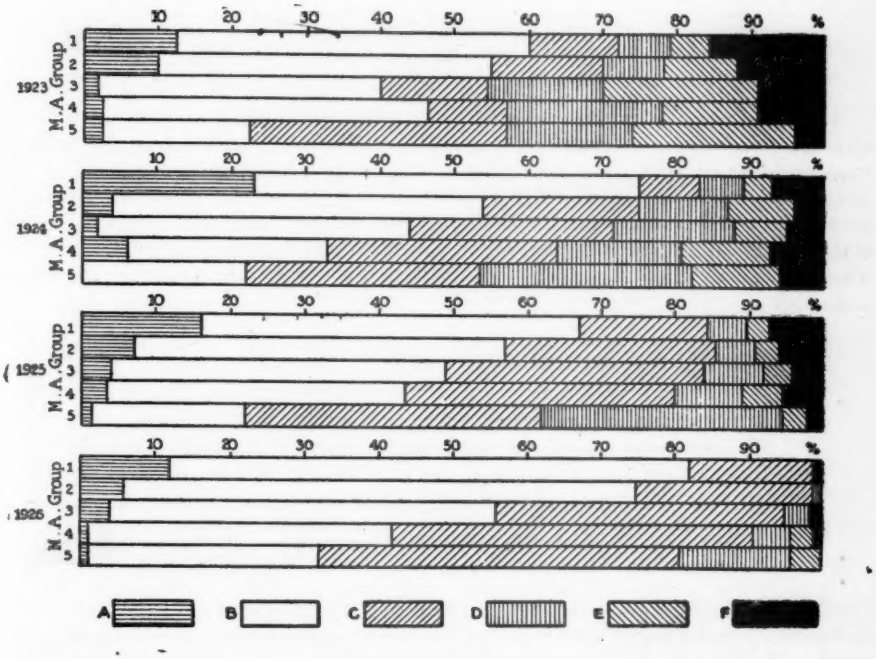

TABLE V

Table V is simply a new grouping of the various strips composing table IV. It shows the scholarship standing of the Senior, Junior, Sophomore and Freshman classes distributed into five sections each according to their rank in their Mental Alertness Test. Such a distribution offers a method of comparison not only of the scholarship of each class but also of the value of the Mental Alertness Tests given to successive classes.

The evenness of distribution of grades in the classes of 1925 and 1926 seem to show that the Mental Alertness Tests given to these classes were better adapted to their purpose than were the earlier tests. An alternative possibility is that the students of these two classes all worked on their test with equal seriousness. Such was not the case with the present Senior class when they took their Mental Alertness Test.

In the Selective Process for admission Dartmouth College now asks for a good deal of information concerning an applicant in addition to a mere passing of an examination or to receiving a certificate of qualification. The college asks for a statement regarding his scholarship in preparatory school in comparison with his classmates. It inquires in what sixth of his class in scholarship the applicant stood.

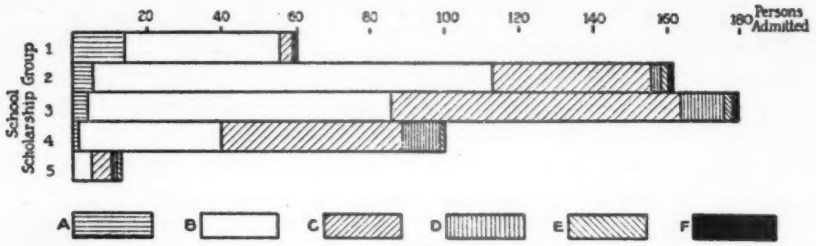

TABLE VI

Table VI shows the actual number of those who were admitted to the present freshman class from each of the six scholarship groups into which a preparatory school graduating class could be divided. The table does not show the total number admitted to college but only those whose record was in every respect complete. It will be noticed that the lowest sixth of the preparatory school class was not represented at all in the freshman class and only thirteen of the fifth sixth. The great bulk came from the second and third. The table shows the attainment in scholarship of the members of each group who were admitted.

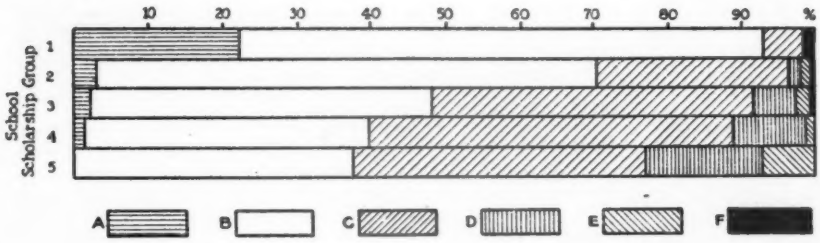

TABLE VIA

In order to make more clear the actual attainment of those students who are represented in table VI this table was compiled and shows the same facts on a percentage rather than on a numerical basis.

The indications are clear that the better a student is in preparatory school the better he will be in college. It shows also that those who stand about the middle or below the middle of a preparatory school class are not likely to make satisfactory progress in college.

In addition to inquiring about the scholarship of an applicant for admission Dartmouth College asks also for a statement regarding the applicant's industry or faithfulness in preparation of his work.

Part II. Entering College Young

College presidents have given a good deal of attention recently to a discussion of the advisability of encouraging students to begin their college course at a much earlier age than they do at present. Some presidents have argued that men should be urged to enter college at the age of seventeen or less. They give two reasons for their opinion. The first is their belief that as a rule students who enter college young take a higher

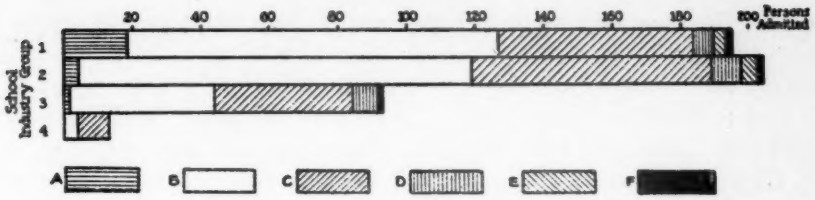

TABLE VII

Table VII shows the actual number admitted from each of the groups. It will be noticed that Groups 5 and 6 are not represented at all. It will be noticed that the great bulk of the present freshman class came from the first and second sixths of their preparatory school classes.

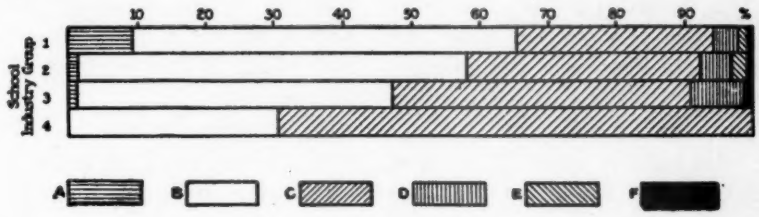

TABLE VIIa

This shows the facts of table VII but arranged on a percentage basis. Like table VIa it shows that the more industrious a student is in his preparatory school the better will be his rank in college and it also shows, like table VIa, that a boy who stands about or below the middle of his class in industry or application is likely to prove an unsatisfactory student in college.

stand in scholarship than do the older ones. Their second reason is that the long preparation now required for professional or commercial careers tends to force men to begin their life work too late. They believe that in some way the secondary school preparation for college should be speeded up.

It is well known that the professional schools and business in general are demanding better preparations. In some instances the length of the professional course has increased and for the majority of careers there is insistence upon a long preliminary academic training. Business is gradually taking on a professional character. Its technique has improved, its content in actual knowledge is enlarged and its demand for more thorough and more intensive non-professional preparation is insistent.

The argument against early entrance to college is based almost exclusively upon the belief that those undergraduates who are below the average in age do not gain what they might gain in the way of social and personal development. It is claimed that the youngest students for the most part lose decidedly in the matter of fellowship and participation in the varied life of an undergraduate body.

In view of this discussion the President of Dartmouth College has asked that the history of the men who entered Dartmouth at an early age be

studied. He suggested an investigation of the careers of those who had entered the classes of 1901 to 1922 under seventeen years of age.

Obviously there are two parts to any such discussion. One should know the history of these men while they were undergraduates and should learn as much of their subsequent careers as may be possible. The first part of this inquiry is comparatively easy; the second part is extremely difficult. For the present only the undergraduate history of the younger men of the twenty-two classes under consideration will be discussed.

The total number under 17 years of age who entered Dartmouth College in the twenty-two classes was 224, of whom 167 received degrees. A review of the group will be made from the standpoints of scholarship, mental alertness, preparatory schools, student activities, social development and entrance upon graduate study.

From the standpoint of scholarship the younger group is conspicuous. In the first place the losses out of the group by failure, withdrawal and other causes are very small. There were only about 25 per cent of them who failed to get degrees, while the normal loss in one class after another seems to be approximately 45 per cent.

In the percentage of those taking honor rank the group stands remarkably high. Out of 224 in the group there were 54 who received honors, or almost 25 per cent of the total. It is difficult to make a comparison with any of the recent graduating classes because the interruption caused by the war has undoubtedly upset any scheme of statistics that might normally be applicable. It seems best, therefore, to compare this total group with the class graduating just as we entered the war. In the class of 1917 there were 38 who received honors. This is a little less than 10 per cent of the total number who entered with that class. The contrast of 10 per cent with 25 per cent is very significant.

More than 16 per cent of the younger group received Phi Beta Kappa standing. The class of 1917 had about 6 per cent of Phi Beta Kappa men.

In addition to the fact that the younger men show an unusually good percentage of those who took high rank in college it is very probable that the whole group took a higher average stand than others who entered college with them. It would be a very long and laborious undertaking to discover whether this is true or not, but an examination of the standing at graduation of each of the 167 men involved in the investigation seems to show that their average rank was higher than that of others in their classes.

There is a common statement that those who enter college younger than the average have made more rapid progress in their school work because they are the brighter boys. Until the last two or three years such a statement could be based only on general impression. There was no evidence to prove or disprove it. Dartmouth College gives a Mental Alertness Test to all freshmen and this test appears in a general way to distinguish the men of the class on the basis of their accuracy, their quickness of perception, their acquired in-

formation, and to some degree their reasoning power. After a class has taken a Mental Alertness Test the members are distributed into five groups according to their performance in the test. The tests given to the classes of 1925 and 1926 seem to distinguish between men more accurately than earlier tests. In these two classes there were 68 who were under seventeen years of age when they entered college. In the highest group on the basis of the Mental Alertness Test, called Group 1, there were 26 out of this total; in Group 2, 18; in Group 3, 10; in Group 4, 12, and in Group 5, 2. If this showing is typical of all classes the opinion of those who have believed that the men who entered college at an early age are on the whole unusually alert mentally seems to be substantiated.

It is sometimes said that the younger men are those who have had a better preparation for college work. This would be true provided it could be proved that they come from better preparatory schools than others do. The fact, however, is that the schools from which the younger men have come since the entrance of the class of 1901 were of all sizes and all degrees of reputation. There is no distinction to be made between these schools and the schools at which other men were prepared. The rapid progress of this group of students would seem to depend upon their own ability or their industry rather than upon a special quality of teaching or upon especially good school facilities.

Those who argue against early entrance to college base their objection on the assumption that the younger men get less out of the college life than those who enter at the average or above the average age. It is extremely difficult to secure adequate evidence on this point. One can illustrate the degree to which they participate in the life of the college by trying to discover to what extent they have engaged in student activities, what percentage were accepted into fraternities and by securing any other incidental evidence that may be gathered.

The only record that is preserved to show what activities the earlier classes participated in is that contained in the annual publication of the Junior Class. This is not entirely satisfactory because the material is furnished by the men themselves. The modest man may not give a full account of himself, while another type of man may stress his achievements beyond their deserts. Moreover one cannot tell from these records just how long or how arduously the men were engaged in the organizations with which they specify that they were connected. With these limitations we must rest contented with a survey of the activities presented in the annual. Of the 224 members of the younger group 65 are recorded as having engaged in organized student activities. This amounts to 22.4 per cent of the total number. In athletics there were 17 who achieved some success; 9 obtained organization managerships; 3 took part in dramatics; 11 belonged to musical organizations.

Because of the insufficient basis for drawing conclusions no comparative percentages will be given, but is does seem to be the case that the activity of the younger men in college organiza-

tions was smaller than that of the average of a class. This is particularly true of athletics. The younger men appear to have obtained their full measure of managerships and to have had an unusually large connection with the college publications. It is evident that the tendency of these younger men was to take part in those student activities that were literary and intellectual in character rather than athletic.

There is an interesting saying among undergraduates that students with a big preparatory school reputation seldom retain their position of superiority throughout their college course. It seems that the vital factor here is precisely the matter of age. One notices in each succeeding freshman class that the leaders are the older men and that it is from these older men that the majority of class officers are chosen. The difference in age is less significant as a class advances toward graduation. In senior year it seems to be the case that the men of average or less than average age have overtaken the older men in their hold upon the confidence of their classmates They obtain the major part of the class officers and take their place distinctly in leadership of class opinion.

Another piece of evidence as to the social qualifications of students may be illustrated by admission to fraternities. In the twenty-two classes under discussion there were 167 men under 17 years of age at entrance who remained in college and received degrees. Out of these there were 102 who were admitted to fraternities, while 65 were not. This means that practically two-thirds of the very young men became fraternity men. No effort has been made to make a complete comparison for all of the twenty-two classes, from 1901 to 1922, but three classes have been chosen at equal intervals throughout that period. These are the classes of 1902, 1912 and 1922. In the class of 1902 there were 69 fraternity men and 62 non-fraternity men. In the class of 1912 there were 115 who joined fraternities and 97 who did not. In the class of 1922 there were 180 fraternity men and 49 non-fraternity men. In the three classes the total number of fraternity men was 364, while 208 were not taken into fraternities. That is to say, slightly less than 64 per cent of the members of these three classes entered fraternities. If these three classes may be regarded as typical of the twenty-two classes in succession it would seem that the younger men were fully up to the average of their classes, provided admission to fraternities may be taken as evidence of social success.

There is one further point concerning the younger men that is deserving of attention. They evidently maintain their strong intellectual interests beyond the time of their graduation from college. This is proved by the fact that out of the 167 who graduated from the twenty-two classes there were 77 who entered graduate schools in order to prepare themselves for professions or occupations demanding additional study. The nature of their graduate study is of all types, including engineering, chemistry, law, medicine, ministry, teaching and commerce. It may be mentioned that one of them became a Rhodes Scholar and another after a short period spent in teaching

obtained a rather prominent position in one of the foundations for the advancement of scholarship. In the class of 1922 about 30 per cent of the total number receiving degrees have entered graduate schools for one purpose or another. This may be contrasted with the 46 per cent of the younger men under consideration.

A study of this kind is incomplete and inconclusive without the additional history of these same men since graduation. In order to determine the total degree of their success it would be necessary to follow them after graduation and make a comparison between their accomplishment and that of their older classmates. Records are not yet available to make this study with the thoroughness that would enable us to draw satisfactory conclusions. Material will be accumulated gradually and the study completed at an early date.

News Notes

SIXTEENTH ANNUAL MEETING OF THE NATIONAL ASSEMBLY OF CIVIL SERVICE COMMISSIONS, WALDORF HOTEL, NEW YORK CITY, JUNE 18 TO 22.

The various civil service commissions of the country were represented at the Convention by about two hundred delegates, who discussed various personnel problems of common interest.

At the opening session Mayor Hylan spoke.

One afternoon session was devoted to the new Bureau of Public Personnel Administration which has been organized largely by the initiative of civil service people. It is apparent that civil service commissions are taking a more and more professional attitude toward their work. The discussion of the new Bureau related to the service which the commissions expect from it. There is considerable interest on the part of civil service commissions in the use of intelligence tests, the short-answer methods, and the objective examination procedures. These methods are in successful use by the civil service commissions in Boston, San Francisco, Minneapolis, Milwaukee, and by the United States Civil Service Commission. Other problems in which the commissions want to pool their experience relate to administrative procedures.

One session was devoted to a discussion of personnel control in public and private personnel administration. It is becoming increasingly evident that the personnel problems of the civil service commissions are in many respects similar to those of private industry. It can safely be said that the selection methods that are in general use by the civil service commissions are far superior to the methods that have been developed in private industry. Personnel men in industry can therefore learn much from the selection procedures that are current in the civil service. This session was addressed by Mr. Sam A. Lewisohn, Vice President and Treasurer, Miami Copper Company; Mr. Oliver C. Short, State Employment Commissioner, Maryland; and by Mr. W. W. Kincaid.

Classification and promotion was the subject of another session, which was addressed by Mr. Guy Moffett, Member of the United States Reclassification Board. Among those participating in the discussion were Police Commissioner Enright of New York City and Mr. Charles S. Shaughnessy, Chief Examiner, Philadelphia Civil Service Commission. Other sessions were devoted to intelligence and psychological tests and to problems of pension and retirement systems. It is fortunate that fields of public and private personnel are becoming recognized as not entirely distinct. The people who are responsible for personnel work in these two fields have many problems in common. Civil service commissions are also becoming interested in the application of scientific method and experimental procedure in discovering the facts and principles that should guide personnel work. This interest has been brought about partly by recent developments in examination methods. On account of the fact that civil service examiners deal necessarily with examinations, they are in an ideal situation for carrying out scientific studies in employment selection, and during the next few years we may expect a number of very valuable studies from their work.

NATIONAL CONFERENCE OF SOCIAL WORK

Over four thousand delegates met in Washington in May to celebrate the fifteenth anniversary of the National Conference of Social Work. Spokesmen for

social work in England, France, Belgium, and Germany had been invited and representatives from a score of other countries were welcomed.

The program of this meeting was a departure from custom, as each day was given over to a single theme, thus acquainting the full body of the conference with the contributions in each field. The following are the subjects in the order in which they were presented: health, industry, law and government, the church, the home, education, and public opinion.

At one of the by-meetings, the delegates listened to pleas for American participation in the World Court, America's entrance into the League of Nations, to reports on the work of American citizens in the practical activities of the League with respect to the combat of epidemic disease, the control of the drug traffic, the protection of women and children, and the promotion of labor standards.

The presidential address was a review of the history of the conference noting the differences in emphasis in its five decades. The note of prevention has been struck for the past twenty years in the conference proceedings and retiring president Mr. Folks pointed out the transition from an article of faith to an operating program with measurable accomplishments.

The following officers were elected for the National Conference of 1924 to be held in Toronto:

President: Grace Abbott, director Federal Children's Bureau, Washington.

First Vice-president: Lee K. Frankel, third vice-president Metropolitan Life Insurance Company, New York.

Second Vice-president: Rev. Peter Bryce, secretary Social Service Council, Ontario.

Third Vice-president: Judge James Hoge Ricks, Juvenile and Domestic Relations Court, Richmond, Va.

New members Executive Committee: M. Edith Campbell, director Schmidlapp Fund, Cincinnati; Martha P. Falconer, American Social Hygiene Association, New York; John L. Gillin, national director Educational Service, American Red Cross, Madison, Wis.; C. MacLean, secretary Federation for Community Service, Toronto; and Amelia Sears, assistant general superintendent, United Charities, Chicago.

CONSOLIDATION OF "MANAGEMENT ENGINEERING" AND "ADMINISTRATION"

The editors of "Management and Administration" have presented their readers with a larger and stronger magazine, which is devoted entirely to the interests of effective executive control. In the new publication will be found the subject matter which heretofore appeared in separate issues of "Administration," "The Journal of Business Analysis and Control," and "Management Engineering," "The Journal of Production Control."

On the new editorial staff will be found the editors of both "Administration" and "Management Engineering." The articles appearing in the new magazine have been increased in number, and the special features of the consolidated publications have been retained in full—"The Editor's Page," "The Reader's Page," "Conditions and Prospects in Business and Industry," "Current Book Reviews," and "Management Data."

The editors express the hope that the "friendly appreciation and support so freely given to "Administration" and "Management Engineering" will be continued in the same generous measure to "Management and Administration," and well it should be, for their subscribers now have a larger and stronger magazine at no greater cost."

GIFT FOR SCIENTIFIC RESEARCH

Both here and abroad scientific research is affording new and larger channels for the aspirations of the engineer. "The Bulletin of the Federated American Engineering Societies" reports a gift of $500,000 from Ambrose Swasey of Cleveland making possible the organization of Engineering Foundation. This is followed by the news that Sr. Alfred Yarrow has given the same amount to the Royal Society for the same purpose.

Sir Alfred Yarrow is an honorary member of the American Society of Mechanical Engineers, and his philanthropy may be characterized as another step toward the identity of effort which engineers and scientists are striving for throughout the Anglo-Saxon world.

In making this gift Sir Alfred said, "I should like to record my firm conviction that a patriotic citizen cannot give money, or leave it at his death, to better advantage than towards the development of science, upon which the industrial success of the country so largely depends."

VOCATIONAL EDUCATION

The General Education Board, 61 Broadway, New York City, has recently published "Public Education in Indiana," A Report of the Indiana Educational Commission, a book of more than 300 pages. This study comprises a survey of present conditions and a forecast of needed improvements. Chapter VII which deals with the problems of Vocational Education in Indiana contains some rather drastic criticisms of recent policies in that field of education. The vocational education people will probably have a difficult time answering some of the questions raised in that chapter.

POSTURE IN WOMEN'S WORK

The following bulletin was received from the United States Public Health Service:

The effect on the physique and on the health of industrial workers of the monotonous and rapid repetition hour after hour and month after month of movements in themselves light and simple has recently begun to challenge the attention of the medical profession, says the United States Public Health Service. Especially has it done this since this work, so characteristic of modern industry, has been more and more monopolized, unusually on a piece basis, by women whose deftness and swiftness have enabled them to take possession of occupations which did not require much muscular strength.

So far, although conclusive proof is lacking, the weight of opinion seems to be that serious injury may be caused by any work, the performance of which requires cramped, constrained, or awkward posture. Less general and less positive is the opinion as to the effect of the work on the nervous systems, especially in women.

Work that requires bent shoulders and dropping of the head compresses the chest and interferes with the breathing, and this alone leads to many ills. It also forces the ribs and all that they inclose down upon the abdomen and tends to displace its organs. Among other results causes a "folding in" of the wall of the abdomen along the belt line and the partial stoppage of material moving through the intestines, and this leads to constipation, diarrhea, nervousness, abnormal fatigue, and headaches.

Work that requires a sideway "slouch" crowds the ribs between a low shoulder and a high hip on one side and expands them on the other side, interfering with the breathing and paving the way for tuberculosis. In girls and women this slouch also tends to displace other important organs.

Such results may be prevented or lessened by change of work; for instance, a change from work that requires stooping forward to work that requires reaching upward, or that requires a sideways slouch, or that requires no particular attitude. Such a change naturally involves a loss in speed, which for a time may cause serious money loss to a piece worker; but, especially in young girls, it will help to prevent ill health and possibly deformity.

Proper chairs are also helpful. For instance, as sitting all day at one's work is probably nearly as bad as standing all day, a combination of chair and desk (or work bench) whose relative heights would permit one to work with equal ease whether standing or sitting may be advantageous. Many types of "proper" chairs have been designed; but, naturally, few or none of them seem to be fitted to all types of work. Certain factors seem, however, to be advisable in all chairs.

All chairs, for instance, that are too high to permit the occupant's feet to rest firmly on the floor, should be provided

with a foot rest that would prevent the lower part of the legs from dangling and the upper part (thighs) from pressing against the edge of the chair; practically, this means that women should not be called upon to use chairs built for men. Rests for the back are also extremely helpful in lessening fatigue.

That the constant repetition of a movement does in time affect the nervous system is more than probable, but how importantly it affects it has not been established. Anderson, for instance, states that girl after girl in a cigarette packing factory was found when off duty to be constantly repeating the motions she made while at work; and insists that such tendencies should be investigated.

The best preventives so far suggested seem to be the daily utilization of the forenoon and afternoon rest periods now in vogue in most factories either in complete rest or in exercising muscles not used in working time. When combined with periodic changes in occupation that call for changes in the muscles used such utilization should give effective help in preventing serious troubles.

Book Reviews

HEALTH SERVICE IN INDUSTRY

By W. Irving Clark, M.D. x + 168 pp. 1922.

The Macmillan Company, New York.

REVIEWED BY CHARLES J. STEIM, M.D.

The author of this book is to be congratulated. He has done his work in a painstaking, orderly manner. Health service in industry has so many constructive possibilities and ramifications that even an attempt to outline them in one volume is no small undertaking. In this book, as in most other books and special articles on the same subject, the deductions are made entirely from studies of centralized groups of workers. The problem of health service to employes of industrial organizations whose activities are widely scattered, both vocationally and geographically, are almost completely lost sight of.

Prominent among the organizations referred to are our various public utilities who employ thousands of workers in almost every community. Health service to these workers cannot be centralized as in plants or factories, yet the nature of the service they render to the public makes their welfare of special concern, not only to the employers, but to the community as well. It is to be hoped that the able author will remedy this apparent omission in the next edition of his valuable book.

Doctor Clark describes industrial organization in detail in the first chapter. His outline for service division is sound. The outstanding feature being to have the service division center in the medical department. A medical man is the logical head for a service department for many good reasons, not the least of which is that the relation between patient and physician is a natural ready-made contact point between management and employe.

His outline of the medical needs of a small factory forms one of the most instructive chapters in the whole book. It deals with fundamentals and can be studied with profit by industrial executives, however small or large their respective organizations may be.

The organization of medical service in a large factory is carefully worked out and comprehensive. Maintaining relations as between physician and patient at every contact point is rightfully emphasized. The classification of persons examined for employment by groups according to physical condition is open to question. It has proven more satisfactory in the reviewer's experience to have an applicant referred to the medical examiner for opinion as to his individual fitness for a certain class of work. With the job's requirements fully in mind, the medical examiner can quickly decide whether the candidate fits or not. If he does not meet the requirements of the job to be filled, but might fit some other job specification, the examiner can so indicate to the employment department on the examination form.

Physical examination for prospective employes is discussed in detail in another chapter, but no stress is placed upon one important function of the medical examiner, i.e., the decided influence a tactful and experienced examiner can exercise upon the attitude of the applicant toward his future work and employer.

In chapter V the industrial physician and nurse are discussed. The subject is introduced by quoting Doctor O. P. Geier's

most complete definition of a *real* industrial physician. It is to be hoped that the medical director who is quoted as "wishing a high turnover among the docters on his medical staff" is alone in his wish. Future industrial medical executives *must* receive the most important part of their training helping to solve each problem as it comes up in the course of the day's work on the job. In discussing the industrial nurse and her functions, the author skates on pretty thin ice. That there are nurses having the natural and acquired qualifications necessary to meet Doctor Clark's idea of what a nurse can and should do is not questioned, but we believe them to be few and far between.

The chapter on accidents and their treatment covers the ground. Lay first aid is restricted, as it should be, to meeting the emergency until qualified help is summoned. In connection with the treatment of injuries or alleged injuries, it is the opinion of the reviewer that cases with a possible legally enforceable claim, either under compensation laws or otherwise, should be identified as soon as possible and routed for treatment accordingly.

A question in the mind of a worker as to whether an employer furnishing medical or surgical service is actuated by altruistic motives, or simply wishing to protect himself under the law, frequently influences his general attitude toward the employer and the job.

A close study has been made of sickness in the factory and illuminating figures and tables are given. The deductions presuppose an unusually complete health department but are none the less interesting and instructive to those who do not have such facilities at their command. As noted in this chapter, close coöperation with the family physician is necessary. It might be pertinent to add here that much of the future usefulness of health service in industry will depend upon coöperation with the medical profession and community health activities generally.

Many may object to the author's "standard forms of treatment" on the score that they will tend to destroy the initiative of the younger members of the medical staff, also to attenuate that desirable private physician and patient relationship.

Under sanitation the author deals with the control of ventilation, illumination, temperature, humidity, drinking-water, dust and nuisances which might affect health. He makes all sanitary officers finally responsible to the chief physician, which is obviously logical and correct. Under ventilation, this statement is made: "The reduction of oxygen and increase of carbon dioxide which occur in the average factory. . . . . are of no harm to the healthy worker." Some of us will prefer not to accept this statement at its apparent face value. This chapter on sanitation is so completely and practically worked out that one may safely use it as a guide in meeting any industrial sanitation problem which may arise.

In considering special problems, the author cites many good reasons why industrial organizations should insist upon higher executives submitting themselves to searching physical examinations from time to time.

The last chapter of this highly interesting and instructive book is given over to discussing the cost of medical supervision and economics of industrial hygiene. Many figures are quoted, none of which mean much when applied to health service in industry, generally. The economic value of health service has long been established beyond question. The individual agrees to its value when he employes a family medical adviser, the community when it supports a department of health. National governments, are continuously enlarging, at added expense, already existing departments of health because it has been proven to pay big dividends.

Health service in industry or elsewhere is too big a thing to be measured by the slide-rule methods of the cost accountant, but it is none the less fiscal in final analysis.

CHARACTER QUALITIES OUTLINED AND RELATED

By Gerald Elton Fosbroke. Putnam's, New York. 1923. viii + 166

REVIEWED BY HAROLD E. BURTT

This book is a worthless and thoroughly unscientific contribution to the field of character analysis through physiognomy. Its treatment is entirely qualitative except for an occasional use of the words "medium" or "quite." There is an utter absence of statistical justification for statements made and one dogmatic assertion follows another.

The introduction suggests reference to a complete description of structure and vocabulary used in physiognomy which will be found in a previous book by the same author. The reviewer neglected to consult this earlier book and perhaps for this reason fails to appreciate the present one. However, he did look carefully at the pictures taken from a work by Lavater in the "seventeenth century" (born in 1741), and he also read carefully several chapters (one would have been sufficient). The author expresses himself as greatly encouraged by the "present certainty of knowledge as compared with Lavater's work." The reviewer does not share this enthusiasm regarding "present certainty" as revealed in the pages of the book.

The first chapter on health conditions stresses such things as "texture of body and brain," pressure upon nerves due to obesity, and the effect of bile upon mind and body. The next chapter deals with vitality, which apparently is denoted by medium heavy eyebrows, medium to large bone structure, deep seated eye, compressed brow, etc. It is to be noted that vitality seems to correlate (although the writer never mentions the term correlation) with a great number of traits. Those who have vitality will be "magnetic, alert, irritable, ill-tempered, resentful, jealous," and about a dozen other things.

In succeeding chapters, specific qualities are systematically and dogmatically catalogued. There are four positive or success making qualities, viz., reflective ability, mental action qualities, and mental bodily action qualities. There are two general kinds of destructive character qualities, namely, passive negative and active negative. The general plan of presentation is to describe a given quality and then state its physiognomic counterparts or to merely list its mental components when their counterparts have already been described. We learn, for instance, that reflective ability involves good structures throughout the face, muscles structure elastic, high, full, well-rounded forehead not smooth but having many uneven surfaces, indicating that the muscles of the upper forehead have been used (evidently we reflect with these muscles). The various qualities included under reflective ability comprise the following: concrete reasoning, abstract reasoning, foresight, imagination, psychic knowledge of human nature (nota bene), recipient mind, intuition, memory, creative ability, and others too numerous to mention. All of these are defined and their physiological counterparts stated. Two illustrations will suffice. For instance, two kinds of memory are described and the writer evidently has in mind rote and logical memory. The former goes with light complexion, the latter with dark. Again, a person with imagination has the upper third of the forehead considerably over-hanging the lower third of the forehead with the brows thrown back.

Perceptive ability is likewise subdivided into such things as subtlety of mind, mental alertness, logic, conservatism, etc. Mental alertness, for instance may be detected by a strongly compressed brow throughout its full width with a well developed upper forehead and a full, deep-seated eye. (This is somewhat simpler than the usual procedure of developing tests for mental alertness.)

Mental action qualities include such things as decision in minor or major matters —differentiated by the breadth of the tip of

the nose—psychic decision, continuity of purpose, will power, and others. The passive negatives include such things as sullenness, moodiness, discontent, suspicion and the like. It is not worth while to go into detail into the other chapters—they are of the same calibre.

The final chapter upon aptitudes attempts to analyze vocations into mental traits requisite, and by reference to the index one may determine exactly what physiognomic configuration fits one for undertaking various types of work. Among the occupations analyzed are the following: executive financier, salesman, mechanic, inventor, scientist, buyer, office manager, employment manager, and others. The value of these statements, however is somewhat doubtful. Salesmanship for instance, involves thirty-two qualities, and if the physiognomic counterparts of these are combined it makes a rather complex picture to use in employing salesmen. In some instances, the combination of physiognomic traits for a certain occupation leads to actual contradiction. A designer for instance (p. 159) requires among other things, mechanical ability and constructive ability. The former involves "brow rather narrow in structure, than broad" (p. 151), while the latter has the "brow . . . . broad and square" (p. 148).

The jacket covering the book states that it is "particularly designed for those who have already studied the subject, and who realize the importance of relying not upon one indication but upon many. It treats of approximately 150 specific qualities, with a definition of each followed by a statement of the different structures of the head and face that will indicate these individual qualities." The reviewer suggests that the statement might well be revised to read as follows: "The book is particularly designed for the unscientific reader who knows nothing about the subject and hopes to know less. It treats of approximately 150 interrelated and overlapping qualities with a definition of each, followed by a confusing statement of the different structures of head and face that will indicate these qualities." If the book meets with a large sale, it will be a further vindication of the late Mr. Barnum's famous epigram.

PRACTICAL PSYCHOLOGY FOR BUSINESS EXECUTIVES

By Lionel D. Edie, Associate Professor of History and Politics. Division of Current Industrial Problems, Colgate University. H. W. Wilson Co., New York. 1922. 387 pp. Cloth.

REVIEWED BY JOHN MCCLAIN

The business man of tomorrow will find himself face to face with the task of increasing human productive power. It is a matter of common knowledge that science and material things have been developed to a far greater extent than the factors that are concerned with human beings. Problems that deal with the development of the human factor are therefore, timely and beneficial to business and industry. The solution of such problems will have as its basis a comprehensive knowledge of the individual and group and their relation to industry. Having the individual and group as its subjects, psychology is striving to master the how and why of human behavior. So often a practical study of psychology is beyond the reach of the busy executive both from the standpoint of time and involved subject matter. Psychology is bound up with statistics and an abstract terminology. In an effort to aid the business executive in making an acquaintance with the important and useful writings on

the applications of psychology to industry, Mr. Edie has published this book.

The work is an organized collection of writings that deals with the major industrial problems of personnel and applied psychology. He has chosen as sources prominent authorities in many fields—psychologists, industrial executives and men of public affairs who represent in general theory, labor and capital. It is conspicuously devoid of statistics.

Selecting as his first topic the Psychological Basis of Industrial Relations he offers evidence of the necessity for improvement in human productive power showing in general the power underlying human instincts and just how and where they enter into industry.

His second topic, Executive Management and the Mind of the Worker gives a perspective of the management factor and its relation to the psychology of the worker and establishes a basis for scientific management.

The third topic, Balked Instincts—the Basis of Industrial Disorders, recognizes the results of the distortions of the prime forces underlying human behavior and their consequences. These it is shown lead to waste and dissatisfaction.

In dealing with Satisfied Instincts—the Basis of Industrial Efficiency he mentions methods of enlisting and fostering coöperation between the worker and management. He also mentions some of the satisfactory results obtained.

The material offered on the Economic Power of the Creative Instinct singles out one of the potent forces operating in labor and describes the arousal of this instinct. The chapter includes a discussion on Making Men Like Their Jobs.

In Labor Traits and Crowd Behavior, such subjects as the group mind and the group spirit are discussed as well as the general incentives of labor as a group.

One of the important topics discussed is The Far Reaching Consequences of Fear in Industry. In this chapter it is shown that the element of fear on the part of the worker is definitely linked up with the individual's production, thinking and general conduct.

Other chapters deal with material definitely related to the following problems: The Psychological Problem under Self Assertive Management, The Basis of Employee Representation, Interest and Incentives in Industry, The Psychological Aspects of Labor Turnover, The Building of Loyalty and Morale, Labor's Part in Employee Service Work, The Mind of the Alien and Americanization, Factors in Industrial Education, The Value of Psychological Tests, Fatigue Control and Industrial Efficiency, The Pathology of the Worker and the Contributions of Abnormal Psychology to Business Problems.

Generally speaking, the book is a fair symposium of the constructive material that has been written in the past decade. Professor Edie has been particularly liberal in his choice of authorities and contributors.

Any treatise on applied psychology, which aims to win business executives over to its value and methods, must be highly appetizing in style. While this unquestionably is one of the aims of the book it is doubtful if it succeeds to any great extent. It is quite true that Mr. Edie has picked the choice fruits from many of the fields of industrial psychology, but it is feared that the aims of the book suffer from brevity and lack of close continuity of the mass of material presented. On the other hand if the book is to be considered as evidence alone, it is excellent, for it is rich in examples of many of the problems encountered daily by the business executive. It brings to light some of the possibilities contained in the application of psychology to business. A rather complete bibliography of the subject matter is included.

SELECTED ARTICLES ON SOCIAL INSURANCE

Compiled by Julia Johnson. The Handbook Series. H. W. Wilson Company, New York. 1922. xliv + 381

REVIEWED BY WILLIAM E. LANGE

Consideration of the important subject of Social Insurance gives rise to the following questions:

1. Shall the worker of today be automatically protected from the exigencies of disability due to industrial accident, old age, etc.?
2. Shall the state compel insurance?
3. Shall this insurance be administered by the state or by private insurance companies?
4. Shall pensions or benefits be extended gratuitously to the worker by the state?

These questions can not be answered without an intelligent knowledge of this subject. As an aid in the obtaining of such knowledge this compilation should prove of value. Although intended more specifically for the debater, it presents to the general reader in a compact popular form much information which should enable him to answer these questions for himself. Leading arguments pro and con are presented impartially on the subject. Most of the articles selected are well chosen and with few exceptions up-to-date.

For the debater, the book includes briefs for arguments, a bibliography of literature on the subject, and a list of organizations both favorable and opposed to Social Insurance. In addition to discussions on Maternity Benefits, Invalidity, Relief for Widows and Orphans, and Soldiers and Sailors Insurance, there are general affirmative and negative discussions on the following subjects:

Social Insurance
Workman's Compensation
Health Insurance
Old Age and Invalidity Insurance
Unemployment Insurance

Abstracts

The Three Divisions of Management. JOSEPH MAYER, Management Engineering, April, 1923, Vol. 4, No. 4, pp. 255-257.

At the close of the first year's work of the Management Division of the American Society of Mechanical Engineers in 1921, the Executive Committee offered the following definition of management:

Management is the art and science of organizing, preparing and directing human effort applied to control the forces and to utilize the materials of nature for the benefit of man. The three functions of management suggested in that definition have since been carefully analyzed and substantiated, with the result that a wide acceptance of this threefold division is assured. These principles apply to any industry or business, no matter what the size.

As a rule, the organization of a manufacturing concern follows certain well defined lines. The usual problems dealt with relate to production, finance, sales, personnel and a miscellaneous group dealt with by the general management. A business cannot be successfully managed unless it functions as a unit; unless its various activities are dovetailed in a definite and understandable manner; and unless management knows accurately what all these activities and relationships are. Here is where the function of preparation or coördination is called into action. Directing is the administrative function of management. It represents the execution or carrying out of the objects for which the enterprise is organized and its various activities coördinated. It works through the organization set up and makes use of the coördinating or preparatory procedure that has been established. It sees that work is put through the factory; that the personnel is properly trained and cared for; and that the current day to day needs are met; in short, that the best is gotten out of the men, materials, and equipment provided.

Management As A Whole. W. W. KINCAID. Management Engineering, April, 1923, Vol. 4, No. 4. pp. 209-210.

During the last eighteen months the movement to consolidate organizations dealing with employment and personnel matters into one society or association and to enlarge its field and purpose has made substantial progress. The clarifying thought that personnel work is a part of management in industry and commerce has found definite expression within the past month in the change of name of the National Personnel Association to the American Management Association.

In spite of the fact that the personnel aspects of management have received general attention for only a few years compared with the period of development of technical or engineering management this non-technical branch is the first to bring about a union of interests and forces. The basic thought underlying both the technical and non-technical developments in management is recognition of the employer's responsibilities to his workers, to the industry and to society. Personnel work cannot be segregated into an air-tight compartment of its own and all efforts to bring about such separation are foredoomed to failure.

We must more completely round out our concept of management to include the control of technology, the direction of personnel and the administration of money. We can then think of management as "the art of getting all things well done."

Philosophy of Management. Welfare Work, March, 1923, Vol. IV, No. 39, pp. 45–46.

This article is an editorial comment on two recent books—"The Philosophy of Management" by Oliver Sheldon, and "Industrial Organization" by John Lee.

"When welfare workers become so engrossed in their work that thay cannot see the wood for the trees, Mr. Sheldon's book will promote the taking of a more philosophical view."

Regards management as a profession, involving high ideals, training and large responsibilities. Introduces management as a third factor into partnership with capital and labor.

Proceeds to analysis of different types of factory organization. Suggests employment supervision should be augmented by work of psychologist but position is rare in England.

Sanctions welfare work. It is an integral part of the science of management. Says that specific training is required for management including foremen. Views on trade unionism—"It has accomplished more than any other factor in bettering the lot of the workers of this country."

Mr. Lee's book deals with a mass of facts with regard to various types of industrial organization. Not philosophical. Devotes much space to joint schemes, councils and works committees in various countries. Suggests that a study of French methods in employment management is well worth while.

"The lesson for welfare workers and others from both books is that as welfare work is a part of management and management is a difficult profession, it behooves them to study, read, and think both before taking up the work and while engaged in it, so as to fit themselves for the difficult task in the future."

Seven Axioms of Organization. P. F. Walker. Industrial Management, March, 1923, Vol. 65, No. 3, pp. 144–146.

The administrator who has the task of laying out his operating force and assigning proper men with proper degrees of authority has a difficult task, and there are no set rules that can take the place of sound judgment and common sense. Experience has taught that there are certain basic essentials to good organization as outlined here.

1. The motives of the administration are bound to be reflected in the organization plan.
2. Emphasize the dominant element in production—whether it be material, equipment, process or labor.
3. Authority and responsibility must go hand in hand.
4. Distinguish between personnel control and operating technique.
5. Don't make places for men. A corollary to this is, "when a place exists don't hesitate to put a man in it."
6. Make all organization assignments definite.
7. Be fair. Labor can no longer be fooled.

Qualifications for Personnel Work. A Symposium. Personnel Administration, March, 1923, Vol. II, No. 3, pp. 3–8.

Personnel work means so many different things to so many different persons that it is extremely difficult to establish any set of qualifications as the basis for the selection of men for all possible positions. A group of twenty persons who responded to a letter regarding qualifications for personnel work give some very important suggestions.

From these letters we may conclude that the first step in the selection of a staff personnel man is a thorough analysis of the job which he is expected to perform, and the second step is a thorough analysis of the qualifications required for that job.

Requisites for the office include a suitable personality, an educational background of considerable breadth and practical experience preferably in business. The applicant's references should be extensive and creditable.

The function of the personnel man is to study human management problems and to recommend solutions for them in terms of selection, training and organization, keeping always in mind the development and well being of all persons employed by

by the company. To exercise this broad function the personnel director must have a basic knowledge of the management in addition to a complete knowledge of the technique of personnel work.

Standardizing Occupational Terminology. ALBERT SMITH FAUGHT. American Management Review, April, 1923, Vol. XII, No. 1, pp. 23–25.

Reports the inception of this work at the Conference on Training for Citizenship and National Defense and the subsequent conference at Washington under the auspices of the National Research Council.

An analysis of the activities in this field has indicated that there are seven major groups in this country actively engaged in in this work. These groups are: National Personnel Association, representing private industry, Joint Committee on Terminology and the Engineering Council, representing the engineering interests, the Federal Government, National Assembly of Civil Service Commissions, representing states and cities, American Council on Education, representing the colleges and universities, American Federation of Labor, representing labor and the National Research Council, representing research, All of these groups are organized excepting the Federal Government.

The work of this new organization will be facilitated by the experience already obtained in establishing and operating the Bureau of Personnel Administration which will deal with studies such as the following:

Classification of positions.
Tests for skilled trade positions.
Test for stenographers and typists.
Tests for library positions.
Service (efficiency) rating systems.

Research and Teaching. DEAN BARNES. Science, April 13, 1923, Vol. LVII, No. 1476, pp. 445–446.

Reviews the present growing tendency for business to encourage and conduct pure science. Predicts possible inversion of the method by which worlds' knowledge has been deepened in the past by which business will be the teachers of pedagogues. Research workers will serve as town criers to herald the information great business corporations have wrested from the infinite.

How Modern Business May Aid in Reconstructing the Curriculum. CHARLES H. JUDD, School and Society, March 17, 1923, Vol. XVII, No. 429, pp. 281–287.

Present examples of the conscious influence of business on the public school curriculum. Bankers, lumbermen and merchants of the tea and coffee trade are cited as recognizing the school as an influential agency of propaganda. Negative forces of business in removing from schools what it considers as unsound economic teachings are evidenced. Other factors tending to cause similar changes in course content are the students preference for vocational and specializing courses and the demand for commercial courses in the secondary schools.

Changes are taking place in an unguided and unorderly manner and the plan that some organization or commission which will attact the problem of properly heeding business demands in curriculum construction is set forth.

It is suggested that the Department of Superintendence of the N. E. A. appoint a commission to carry out this program of curriculum reconstruction.

Correspondence Instruction in Industry. ROBERT H. SPAHR. Personnel Administration, March, 1923, Vol. II, No. 3, pp. 13-17.

If you were to picture the average successful correspondence student he would be about thirty years of age—a man with a plan, with vision, patience, determination—intent upon success, and wise enough to realize that a ship does not return unless one has been sent out.

Recently a study was made of 1200 correspondence students enrolled in the Massachusetts State Division of University Extension. According to occupation about 75 per cent were employed in some form of industrial enterprises and only 7.3 per cent were listed under "non-gainful occupations."

Referring to age, 911 of these 1200 were beyond school or college age, 264 were between 22 and 25 years. As to previous education, 35 per cent left formal school somewhere in the grammer grade and 49 per cent somewhere in the high school.

The motives for taking the courses include, preparation for civil service and more advanced course—282, efficiency in present work 356, advancement in position and salary 259, culture interest, enjoyment 267, review of subject 27, social service 9.

The following helpful suggestions are given for the more successful operation of correspondence instruction in industry:

1. Educational directors in an organization employing such an officer should give information and advice regarding suitable correspondence courses.

2. Where an educational director is not employed some other officer should act in such an advisory capacity.

3. Whenever possible the school should supply the company with information as to the progress of each individual enrolled. Superiors should offer attention and encouragement.

4. General talks of an inspirational and informational nature should be given occasionally to all correspondence students within a plant.

5. Short unit courses are generally advisable. That is, there are about twice as many complet'ons in a ten lesson course as there are in a twenty lesson course. However it is also well to plan ahead—a goal, two or three or more years in advance.

6. Courses where lesson pamphlets are used instead of regular text books have by far the greater number of completions.

7. A certificate of some sort is a big incentive for completion.

8. In companies which have an educational director, it is sometimes practical for the company to offer "correspondence courses" for its employees.

9. A recent modification is the "supervised home study" method. Here the people in a plant enroll in a correspondence school. The school in turn designates some member of the company as a local supervisor. These supervisors give assistance and also report back to the school the progress of the students. This plan definitely ties in three parties—the school, the individual, the company.

What the Office Manual Does for the New Employe. ELEANOR GILBERT. The Office Economist, February, March and April, 1923, Vol. V, Nos. 2, 3, and 4.

Reports that the function of the office manual is threefold:

1. To provide in written detail, definite instructions for each job in the office.

2. To make clear the rules of the organization so as to prevent breaches of discipline.

3. To foster a spirit of enthusiasm and coöperation by offers of definite promotion and other methods of stimulation and rewards.

To fulfill these functions the office manual must be readable. Too often the provisions for developing office efficiency and coöperation are adequate, but their manner of presentation in the manual is vague or didactic or dull. A manual that is not read or referred to regularly is obviously a useless expense.

Extracts from successful office manuals are given, as well as some suggestions for preparing or revising effective manual methods.

Vocational Guidance. International Labour Review, February–March, 1923, Vol. 7, Nos. 2–3, pp. 418–425.

Contains notes on the work of the Psychotechnical Institute of the Masaryk Academy (Czechoslovakia), and of the Strasburg Vocational Guidance Office.

Recent publications include M. L. Rémy's report on abilities, habits, reflexes, muscular memory, and the classification of abilities in relation to occupations, presented to the International Conference on Psychotechnics at Milan in 1922 and now published in the Bulletin de l'office intercommunal de Bruxelles, No. 6, October, 1922, and a bibliography on vocational guidance, by Professor O. Lippman, director of the Berlin Institute of Vocational and Industrial Psychology. The title of the letter is Bibliographie zur psychologischen Berufs-

beratung, Berufseignungsforschung, und Berufskunde. It covers 885 books and articles in periodicals, the majority of these being German literature.

Is Scientific Vocational Guidance Possible. JOHN M. BREWER. School and Society, March 10, 1923, Vol. XVII, No. 428, pp. 262–266.

The scope and methods of Vocational Guidance are discussed by a pioneer in the field. Gives five distinct steps implied in the scientific method of Vocational Guidance. The possibilities of measurement in the second step, viz., a sociological and psychological analysis of the parts or steps in the problem, is discussed in the following connections:

a. Is measurement possible in discovery of interests and abilities? Describes trade tests, scales and examinations used.

b. Occupational information. How obtained and measured?

c. Choice of occupation and choice of courses. Gives an account of what is being done in computation of occupational probabilities.

d. Measurement in field of Vocational Education.

e. First job and efficacy of placement.

f. Employment supervision. Suggests a survey to establish a system of index numbers for income.

In most cases the future possibilities of measurement as well as the present methods for research are given.

The Man and the Job. G. M. EATON. Industrial Management, March, 1923, Vol. 65, No. 4, pp. 174–175.

A brief outline of man's relation to his job portrayed graphically. Life in the abstract is described as a hyperbola. Life in the living is climbing the hyperbola. The bottom of the hyperbola is where all men start. As they live and strive to reach their goal at the top of the hyperbola more and more drop out as the climbing becomes more difficult. The going at the bottom of our curve is comparatively easy but every step up demands sticking to it harder to develop the requisite adhesion, and shortly digging in is essential to secure sound toe holds, each successive hold requiring increased effort. Those that are able to dig in step after step reach their ultimate goal.

What Makes A Successful Business Man. ROGER W. BABSON. Forbes, February 17, 1923.

One of a series of articles discussing the fundamentals of business success. Makes the point that the spirit and thrift of a community are greater factors in making prosperity than natural resources. Each generation in a community rears its own successful business enterprises for the older ones die out. It is more difficult to conserve a business after it is created than it is to create it. Most businesses are short lived because the creators know only their special fields and do not know fundamentals. They do not recognize trends of tides in business, and even recurring business depressions carry them away.

Statistics clearly show that almost all successful businesses have been started either in a cellar or in a garret. The Greek fruit dealer, the Jew tailor, the Italian contractor—these may be the great business men of the next generation. The wheel of opportunity keeps constantly revolving. Few are able to retain places on it for long periods. For a business man to stay on the wheel through the periods of overexpansion, decline, depression and improvement is a task, requiring a knowledge of the business cycle and a willingness to change his methods to conform to its effects.

It is not necessary for some to fail in order for others to succeed. There are always opportunities for those who have the "Six I's of Success," namely; Integrity, Industry, Intelligence, Initiative, Intensity, and Inspiration.

Psychology as a Life Work. PROFESSOR RAYMOND DODGE, PROFESSOR EDWARD L. THORNDIKE, DR. SHEPARD I. FRANZ, PROFESSOR W. V. BINGHAM. Science, April 13, 1923, Vol. LVII, No. 1476, pp. 429–431.

States the opportunities offered with psychology as a life work. The first of the short articles treats first with a state-

ment of the scope of the field, prerequisites to a career in it and types of careers. Of these types three groups are made, teaching, research, and applied. These three are given fuller treatment by experts in the respective fields. The educational or teaching career is the more common in the field of psychology but appears to presage work later of a clinical nature which in turn prepares one for industrial psychology. Popularity of the clinical psychological career is growing and opportunities in it surpass in financial and scientific returns that in any other field. Business and industry are not clamoring for psychologists as psychologists, but psychologists who are ably trained are desired for positions in personnel administration, industrial training, business analysis, sales promotion and management, and advertising. Teaching and research in psychology should precede the industrial work to insure success.

Grading the Office Job. I. A Scale for Grading Banking Jobs. FORREST A. KINGSBURY. Administration, March, 1923, Vol. 5, No. 3, pp. 267–275.

Reports the results of investigations in a large national bank in Chicago and also one in Detroit, the former involving over 1200 people in 300 jobs and the latter over 300 people in 150 jobs.

The peculiarities of the problem are discussed and the method of job analysis used is shown. The job-grading scale is given with the method for determining the validity of the scale. The theory of the scale is presented as is the method for organizing the results for practical use.

Are Rating Scales Justified? EUGENE J. BENGE. Industrial Management, April, 1923, Vol. LXV, No. 4, pp. 199-202.

Discussing the group ratings and self ratings of 51 men on the basis of intelligence and height arriving at the following conclusions:

1. Group estimate of intelligence or height will indicate the position of an individual in any particular group with considerable accuracy.

2. Candid self-estimates indicate an individual's relative standing fairly well.

3. The tendency of self-rating is toward over-rating of ability.

Conclusions 2 and 3 are not incompatible since 2 deals with relative position and 3 with absolute.

Labour Legislation and Economic Possibilities. I P DE VOOVS. International Labour Review, February–March, 1923, Vol. 7, Nos. 2-3, pp. 180-187.

Advances the thesis that labor legislation must always aim at an object which is within the limits set by economic law. Labour legislation has in the past been successful in raising the standard of life of the working class in so far as it set up a minimum standard recognized by the community and in so far as it helped the increase of the national income by encouraging improvements in technical means of production.

Lasting improvement of labour conditions can only proceed from a general increase of productivity obtained by normal means, i.e. by technical improvements or increased personal efficiency. While the war has greatly reduced national income, the changed status of the working class has resulted in the passage of laws which attempt to establish standards which are unattainable under present conditions.

Labour legislation cannot be dispersed with nor replaced by a system of collective bargaining. The new sphere of labour legislation should be control of the right of association, labour disputes, strikes and lockouts, collective labour agreements and negotiations for this purpose.

A Cure for Seasonal Employment. C. A. BRATTER. The Survey, March 15, 1923, pp. 800-801.

Advocates factory workers spending part of the year on the farm and farmers spending part of the year in the factory as a cure for seasonal labor.

Experiments in this direction are being carried forward to a large extent in Germany by mining companies, brass and steel corporations. Great swamps have been reclaimed for the purpose; barren

wastes brought under the plow. Thousands of workers are getting a better and more varied diet and are spending the slack season in the fields instead of the city tenements. Farmers formerly dependent upon causal migratory labor are being supplied with dependable help at planting and harvesting time. According to the report their physical and moral, no less than their economic advantages, are noteworthy. It is no accident that agriculture and technique have allied themselves most closely in Germany in the last year and that the German Engineers Association has organized a special department which takes care of these relations and issues a magazine carefully devoted to them.

In a number of our coal fields, especially in Illinois and Iowa, there is a certain amount of shifting between mine and farm. But this shifting is unsystematized and therefore not nearly as fruitful as it might be. However, the possibilities of an interchange between farm and factory are great about the mill towns of New England and the South, and of Michigan, Illinois, and Wisconsin.

Industrial Medicine in 1922. W. Irving Clark, Jr., M.D. The Journal of Industrial Hygiene, March, 1923, Vol. IV, No. 11, pp. 474–478.

Considers industrial medicine as practised in the United States during 1922. The basic activities of the medical department in an industrial establishment are:

1. Physical examination of applicants for employment.
2. Treatment of accidents and sickness occuring within or outside the factory.
3. Preventive medical measures.
4. Supervision of sanitation.
5. Nursing service.

Physical examination of applicants has as its purpose the prevention of the employment of those physically unfit for the work and the proper placement of those with minor disabilities. Most factories employing over 150 employees have a dispensary to which injuried workers can be rushed and properly treated. The first aid man who applied antiseptic to wounds and removed foreign bodies from the eye has passed. Treatment of sickness is still very minor, emphasis being placed upon the prevention of sickness and epidemics. More strict standards of sanitary inspection are now being required by the states. As a dispensary assistant to the doctor and a visiting nurse, the industrial nurse is now recognized as an important factor in industrial medicine.

Ordinance Requiring Health Certificates of Persons Working in Food Establishments Upheld. Public Health Reports, March, 1923, Vol. 38, No. 9, p. 404.

In a habeas corpus proceeding, the Court of Criminal Appeals of Texas had held valid an ordinance of the city of Dallas requiring of any person who works in a food establishment a health certificate showing that such person has been examined by a reputable physician and found free from any communicable disease. The ordinance made proprietors of food establishments subject to the medical examination, and the person who sought the writ of habeas corpus was the proprietor of a meat market who had been convicted for having worked in the establishment without having a health certificate.

Carbon Monoxide Asphyxia, The Problem of Resuscitation, C. K. Drinker, M.D. and Walter B. Cannon, J.D. The Journal of Industrial Hygiene, March, 1923, Vol. IV, No. 11, pp. 463.

Discusses carbon monoxide asphyxia and the problem of resuscitation arriving at the following conclusions:

1. No evidence has been obtained from representative gas companies, which indicates that either the lung motor or pulmotor is superior to the manual prone pressure method of artificial respiration.

2. The evidence obtained leads to the conclusion that if apparatus is to be employed to supplement this simple method of artifical respiration, it should be in the form of some device to provide inhalation of oxygen and carbon dioxide as recommended by Henderson and Haggard.

3. Evidence gathered from hospital records indicates that in gas poisoning any method of artifical respiration which drives air by positive pressure into the lungs may be a source of danger to the pa-

tients treated. Devices such as the pulmotor and lung motor operate in this way and consequently would seem to require further investigation before being recommended for use in gas poisoning.

4. Owing to the fact that other physiological factors enter the problem of artificial respiration in passing, a series of experiments has been undertaken upon further phases of the problem and final recommendations will be offered at a later date. At the present time, the immediate use of the Schäfer prone pressure method of artifical respiration in non-breathing cases, supplemented as soon as possible by oxygen carbon-dioxide inhalations given through a suitable inhaling device seems the best method for rescue crews.

Ventilation of Factories in Hot Weather. T. C. Angus, D.F.C., Graduate I.E.E. Journal of Industrial Hygiene, March, 1923, Vol. IV, No. 11, pp. 479–490.

Discusses the ventilation of a rubber manufacturing concern. The introduction of fresh air by centrifugal fans in quantities sufficient to keep down the temperature of a large factory appears to be difficult and costly. In all possible cases ample roof and side openings should be made, and in most cases they should be so arranged that they can be completely closed in cold weather. Side and roof openings should be of approximately equal area, and in the ratio of their sizes to that of the building which they are to ventilate, should depend upon the nature of the work that is to be done in the building. Suitable opening figures for the ventilation of buildings housing various types of industry are included in the report. The following formula is proposed for use in determining the velocity of air into a building through side openings, and out of it through roof openings of equal area:

$$V = \sqrt{\frac{Ht}{g\,(H-T)}}$$

V = velocity of air in feet per second
H = vertical distance between centers of roof and wall openings in feet.
t = absolute temperature of outside air
T = absolute temperature of made air
g = 32.2

In order to get the best working conditions in a factory it is necessary to give proper attention to the movement of the air around occupants and to vary this to suit the climatic conditions.

Industrial Safety. International Labour Review, February-March, 1923, Vol. 7, No. 2-3, pp. 402–416.

States that the International Labour Office has recently established an Industrial Safety Service to get information on the progress of safety regulations and devices. It shows that safety in industrial establishments depends on three essential factors (a) equipment and working, (b) attitude of employer or his agents, (c) attitude of workers, and that the psychological factor in accident prevention is of prime importance.

There are notes on the report of the Chief Inspector of Factories and Workshops of Great Britain for 1920, on the work of the Swiss Institute for Accident Insurance which was set up by the government but transacts business in the same way as a commercial undertaking and on the work of the Belgian Factory Inspectors. In Austria the report of the Factory Inspectors reflects the difficulties of the economic situation which make it impossible to provide an adequate staff or adopt adequate safety measures. In Prussia, during 1920, the mine rescue service was reorganized. No country has any new safety legislation.

Safety and Production in a Large Plant. H. G. Hensel. National Safety News, March 1923, Vol. 7, No. 3.

The argument that safety devices and rules tend to interfere with production is generally unfounded, for safety, where and when properly applied, has almost invariably produced results as beneficial to production as to the well being of the workmen.

It has been found that where a department in a large plant is kept exceptionally clean, there also are found good accident records and good production records. Data obtained from records have shown that elimination of accidents decreases labor turnover, and this in turn increases production and increases profits.

Several cases are cited of saving men and elimination of costly delays by receiving from employees timely reports of defective equipment.

Supervision and Safety. D. G. PHILLIPS. National Safety News, April, 1923, Vol. 7, No. 4, page 12.

Emphasizes the idea that safety must not be regarded as a side issue, and points to the fact that while all safety compaigns are not successful, there are some really notable results which have been obtained through getting the foreman behind the work. This is achieved through a general manager who recognizes the merit of the safety movement, and who causes those next in line to recognize with him the place of safety as a vital element in the business and the importance of their part in it. The proper route to success here leads from the top down, not from the bottom up, as is the case where we depend on motion pictures and safety picnics for enthusiasm on the part of the men.

Two Wabash Railroad men, in particular, have applied to their work the idea herein set forth as to supervision.

A. J. Bowers, road supervisor over that part of the Peru division of the Wabash lines extending from Fort Wayne, Indiana, to Toledo, Ohio, a distance of 108 miles, during 1922 had under him fifteen section gangs and one extra man—a daily average of 108 men. In that twelve-month period and up to March 1, 1923 not one man under his supervision had suffered an injury.

W. J. McGrath, general yardmaster of the Chicago yards of the Wabash, had under him an average daily force of ninety-two switchmen from May 8, to December 15, 1922. In that seven-month period not one injury occurred in those yards—and we all know switching is dangerous work at best.

How the Railroad Executive Can Help to Promote Safety. C. L. BARDO, National Safety News, April, 1923, Vol. 7, No. 4, p. 21.

The inherent worth of complete coöperation between individuals and departments as a goal toward which efforts shall be persistently directed, must be acknowledged as being based on data obtained from the last ten years of railroad operation.

The New York, New Haven, and Hartford Railroad Company has found that the best results in safety have been acomplished by showing employees clearly that the executives stand squarely behind the safety program. Safety suggestions are treated upon the basis of good will and not on a basis of discipline, this good will basis being enhanced by man to man discussions between executives and employees in safety conferences.

Educating the Construction Worker in Safety. MARY A. TOWNSEND. National Safety News, April, 1923, Vol. 7, No. 4, pp. 19–20.

Describes plan of education followed in training construction workers. Irwin & Leighton show their superintendents that accidents cause not only a loss to the workman, but also an actual loss to the company, due to the cost of training a new man and the demoralizing effect of the accidents on other employees. Superintendents and foremen can see for themselves that the safest way is the quickest, for the production and accidents both show up on bulletin board citations. Foremen are organized into safety committees on every job, and a reward is offered for a good safety record. The company conducts safety classes, and furnishes to foremen loose leaf booklets on Safe Practices in Construction Work issued by the Construction Section of the National Safety Council. For the education of the men, the company employs safety bulletins, moving pictures and lectures during the noon hour, safety calendars, and slips in the pay envelopes on which are printed safety slogans.

What are the Limits of Welfare Work. Welfare Work, March, 1923, Vol. IV, No. 39, pp. 43–44.

Aims of Welfare Work are outlined in answer to an employer's criticism. The scope of Welfare Work has passed far beyond the original meaning of a department for improvement of material conditions of

workers only. The main objects now are: (1) To promote and maintain good relations between management and workers, based on just dealing and mutual coöperation. (2) Improving working conditions. (3) To foster a spirit of responsibility among those concerned, so that industry may be regarded as social service. Welfare Workers should be concerned with the engagement, training and progress throughout working career of employees.

Reorganizing processes should only be attempted when working in close harmony with the management. Results of industrial research should be the Welfare Workers contribution only.

Knowledge of wage records is necessary in order to determine what placements are successful.

Points out that Welfare methods must be different in every firm, that uniformity is not essential.

Rate Setting by Means of Elemental Time Study. FLOYD M. AVERY. Industrial Management, March, 1923, Vol. 65, No. 3, pp. 161–163.

Although time study has shown itself to be the only satisfactory means toward correct rate setting, there are many operations in which the number of variable elements complicate the taking of time studies. These difficulties may be overcome by setting rates for the elements of each operation, plotting curves to take care of the variables, and then combining these element rates in accordance with the particular operation performed.

An example of the problem of setting piece rates on shearing machines in a sheet metal shop. The individual elements entering into the operation were studied and segregated. They were: initial handling or locating time; machine time; relocation time or secondary handling time; and, piling or final handling time. Each element was studied and labor standards were worked out in curve form. Stock was divided into two classes according to gauge. One chart when completed gave the time necessary to pick up a sheet of any size from the stock truck and locate it on the shear table ready for the first cut. The machine time for the various machines was likewise determined and charted. The second handling and piling processes were also studied and charted.

By finding the controlling factor, such as size, weight, or shape, a curve can always be worked out showing the variation of time with this factor. The results have always been accurate and satisfactory.

Value of the Eight Hour Day. Editorial by SAMUEL GOMPERS, American Federationst, March, 1923, Vol. 30, No. 3, pp. 239–242.

Gives the testimony of several employers, such as K. R. Kingsbury, president of the Standard Oil Company of California and Henry Ford, as to the value to their companies of the 8-hour day rather than a longer working period. In the Oil Company, though in the case of drillers 50 per cent were added to the payroll after the change from the 12-hour to the 8-hour day, the cost of drilling decreased during the first six months. Henry Ford testifies to the advantages of an 8-hour schedule in a plant where operating costs are reduced to the lowest possible figure and nothing is allowed to interfere with production. Even Judge Gary can no longer champion the 12-hour day as desirable: it would be well if the United States Steel Corporation would change its practical policy and remove a relic of a more barbarous age.

There is no doubt of the benefits which the shorter work day brings to the worker.

Wages and Hours. The results of the Eight-Hour Day in Sweden. International Labour Review, February–March, 1923, Vol. 7, Nos. 2–3, pp. 321–327.

Discusses the report of the office of Labour and Social Affairs to the Swedish Government on its investigation of the results of the provisional legislation enacted in 1920 on nation-wide limitation of the hours of work.

The report shows that the Act has undoubtedly caused an increase in the cost of production, but that on the whole hourly

output has increased owing to improvements in technical methods and to some increase in the efficiency of the employees. The workers consider that the Act has conferred on them benefits in the shape of increased leisure for recreation and education which they greatly appreciate.

The office of Labour and Social affairs points out the difficulty of pursuing its enquiry in a time of unprecedented industrial depression. It considers that the enquiry has failed to show any adequate reason for the abrogation of the Act or sufficient data on which to base definite legislation. It has recommended an extension of the existing regulations for a further provisional period, i.e., 1924 to 1926.

Railroad Melons Rates and Wages. CHARLES EDWARD RUSSELL. Book Review, American Federationist, March, 1923, Vol. 30, No. 3, pp. 266–267.

States that the author, after long years of accumulating information on the subject, finds capitalization to be the keystone of railroad financial difficulties. To secure additional revenue to meet additional and unnecessary changes on capitalization, the railroads are driven to seek increase of traffic rates and decrease of workers' wages, to rob maintanance funds, neglect repairs and allow accidents to multiply.

In an evil hour for the cause of railroad emancipation Congress ordered a valuation of the physical properties owned by the railroads. In many instances this showed that the railroad company owned more property than the total amount of its capitalization. On this basis a skilful press propaganda campaign convinced the public that the railoads are under—rather than over—capitalized.

The author holds that a railroad as a carrier is not entitled to returns on the value of property owned—which value grows with the growth of population—but only to returns on money actually invested in the enterprise of carrying the public and its goods. Also, if the value of property owned is any basis for capitalization, it is equally the basis for rates to be charged to the public. Therefore since value increases with population, the larger the population the higher the rates would have to be. This doctrine is absurd and impossible.

Only the power of the government can rescue the public from the present disastrous railroad situation.

The New Regulation of Hours of Work on the French Railways. International Labour Review, February-March, 1923, Vol. 7, Nos. 2–3, pp. 328–334.

By a decree dated September 15, 1922, new regulations regarding hours of work on the French Railways were issued. Previous to this the provision of the Act of April 23, 1919 limiting hours of work to 8 per day had been applied to railway workers according to the decisions made between May and November, 1919 by a joint Committee of representatives of the companies and the staff, set up by a Ministerial Order of April 24, 1919.

The railwaymen, through their Trade Union organization and journals have protested against the decree as illegal and involving abuse of authority. They assert that it substitutes regulation of the working year for regulation of the working week which was the object of the Act, that it abrogates joint agreements, signed by representatives of the government, employers and workers, although these had not been denounced by the interested parties and that it suppressed the fortnight's annual holiday formerly approved by the Minister of Public Works. The points of disagreement are still unsettled.

The Russian Central Institute of Work. Management Engineering, April, 1923, Vol. 4, No. 4, pp. 241–245.

Loss of thousands of skilled mechanics during the war and the prevailing undernourishment of the workers forces Russia to save all possible human effort. To train industrial workers and promote management methods this Institution was founded in Moscow in 1920. Management in Russia is no longer concerned with "profit-making management." Its task is to direct human creative power; its scope is human engineering. As a factor, industrial admin-

istration seeks to unite all the knowledge of the past, and as an aim it has in view the life and happiness of men.

The Institute embraces five definite functions: Scientific Department, Laboratories, Educational Department, Museum, and Demonstrating Training Works. The organization is manned with a capable staff of trained scientists, research workers and industrial and management engineers. Some of the results are mass training, centralization and reconstruction.

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